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Enquiry into plants and minor works on odours and weather signs

Theophrastus

888.9
T39p



LELAND•STANFORD•JUNIOR•UNIVERSITY

EOPHRASII

TRY INTO PLATE

WORKS FOR LEAVES
WEATHER SCENE

GLASS PLATE

BY EOPHRASII

EOPHRASII
TRY INTO PLATE

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THEOPHRASTUS
ENQUIRY INTO PLANTS

I

THEOPHRASTUS
ENQUIRY INTO PLANTS
AND MINOR WORKS ON ODOURS AND
WEATHER SIGNS

WITH AN ENGLISH TRANSLATION BY
SIR ARTHUR HORT, BART., M.A.
FORMERLY FELLOW OF TRINITY COLLEGE, CAMBRIDGE

IN TWO VOLUMES

I



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PREFACE

THIS is, I believe, the first attempt at an English translation of the 'Enquiry into Plants.' That it should be found entirely satisfactory is not to be expected, since the translator is not, as he should be, a botanist; moreover, in the present state at least of the text, the Greek of Theophrastus is sometimes singularly elusive. I should never have undertaken such a responsibility without the encouragement of that veteran student of plant-lore the Rev. Canon Ellacombe, who first suggested that I should make the attempt and introduced me to the book. It is a great grief that he did not live to see the completion of the work which he set me. If I had thought it essential that a translator of Theophrastus should himself grapple with the difficulties of identifying the plants which he mentions, I must have declined a task which has otherwise proved quite onerous enough. However the kindness and the expert knowledge of Sir William Thiselton-Dyer came to my rescue; to him I not only owe gratitude for constant help throughout; the identifications in the Index of Plants are entirely his work, compared with which the compilation of the Index itself was

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but mechanical labour. And he has greatly increased my debt and the reader's by reading the proofs of my translation and of the Index. This is perhaps the place to add a note on the translation of the plant-names in the text:—where possible, I have given an English equivalent, though I am conscious that such names as 'Christ's thorn,' 'Michaelmas daisy' must read oddly in a translation of a work written 300 years before Christ; to print Linnean binary names would have been at least equally incongruous. Where an English name was not obvious, although the plant is British or known in British gardens, I have usually consulted Britten and Holland's Dictionary of Plant-names. Where no English equivalent could be found, *i.e.* chiefly where the plant is not either British or familiar in this country, I have either transliterated the Greek name (as *arakhidna*) or given a literal rendering of it in inverted commas (as 'foxbrush' for ἀλωπέκουπος); but the derivation of Greek plant-names being often obscure, I have not used this device unless the meaning seemed to be beyond question. In some cases it has been necessary to preserve the Greek name and to give the English name after it in brackets. This seemed desirable wherever the author has apparently used more than one name for the same plant, the explanation doubtless being that he was drawing on different local authorities; thus *κέρασος* and *λακάρη* both probably represent 'bird-cherry,' the latter being the Macedonian name for the tree.

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Apart from this reason, in a few places (as 3.8.2 ; 3.10.3.) it seemed necessary to give both the Greek and the English name in order to bring out some particular point. On the other hand one Greek name often covers several plants, e.g. $\lambda\omega\tau\circ\acute{s}$; in such cases I hope that a reference to the Index will make all clear. Inverted commas indicate that the rendering is a literal translation of the Greek word ; the identification of the plant will be found in the Index. Thus $\phi\acute{e}ll\acute{o}\delta\rho\nu$ s is rendered 'cork-oak,' though 'holm-oak' would be the correct rendering,—cork-oak (*Quercus Suber*) being what Theophrastus calls $\phi\acute{e}ll\acute{o}\acute{s}$, which is accordingly rendered cork-oak without commas. As to the spelling of proper names, consistency without pedantry seems unattainable. One cannot write names such as Arcadia or Alexander otherwise than as they are commonly written ; but I cannot bring myself to Latinise a Greek name if it can be helped, wherefore I have simply transliterated the less familiar names ; the line drawn must of course be arbitrary.

The text printed is in the main that of Wimmer's second edition (see Introd. p. xiv). The textual notes are not intended as a complete apparatus criticus ; to provide a satisfactory apparatus it would probably be necessary to collate the manuscripts afresh. I have had to be content with giving Wimmer's statements as to MS. authority ; this I have done wherever any question of interpretation depended on the reading ; but I have not thought it necessary to record mere

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variations of spelling. Where the textual notes go beyond bare citation of the readings of the MSS., Ald., Gaza, and Pliny, it is usually because I have there departed from Wimmer's text. The references to Pliny will, I hope, be found fairly complete. I am indebted for most of them to Schneider, but I have verified these and all other references.

I venture to hope that this translation, with its references and Index of Plants, may assist some competent scholar-botanist to produce an edition worthy of the author.

Besides those already mentioned I have to thank also my friends Professor D'Arcy Thompson, C.B., Litt.D. of Dundee, Mr. A. W. Hill of Kew, Mr. E. A. Bowles for help of various kinds, and the Rev. F. W. Galpin for his learned exposition of a passage which otherwise would have been dark indeed to me—the description of the manufacture of the reed mouth-pieces of wood-wind instruments in Book IV. Sir John Sandys, Public Orator of Cambridge University, was good enough to give me valuable help in matters of bibliography.

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I.—BIBLIOGRAPHY AND ABBREVIATIONS USED

A. *Textual Authorities*

WIMMER divides the authorities on which the text of the *περὶ φυτῶν ιστορία* is based into three classes:—

First Class:

U. Codex Urbinas: in the Vatican. Collated by Bekker and Amati; far the best extant MS., but evidently founded on a much corrupted copy. See note on 9. 8. 1.

P₂. Codex Parisiensis: at Paris. Contains considerable excerpts; evidently founded on a good MS.; considered by Wimmer second only in authority to U.

(Of other collections of excerpts may be mentioned one at Munich, called after Pletho.)

Second Class:

M (M₁, M₂). Codices Medicei: at Florence. Agree so closely that they may be regarded as a single MS.; considered by Wimmer much inferior to U, but of higher authority than Ald.

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P. Codex Parisiensis : at Paris. Considered by Wimmer somewhat inferior to M and V, and more on a level with Ald.

mP. Margin of the above. A note in the MS. states that the marginal notes are not *scholia*, but *variae lectiones aut emendationes*.

V. Codex Vindobonensis : at Vienna. Contains the first five books and two chapters of the sixth; closely resembles M in style and readings.

Third Class :

Ald. Editio Aldina : the *editio princeps*, printed at Venice 1495-8. Believed by Wimmer to be founded on a single MS., and that an inferior one to those enumerated above, and also to that used by Gaza. Its readings seem often to show signs of a deliberate attempt to produce a smooth text: hence the value of this edition as witness to an independent MS. authority is much impaired.

(Bas. Editio Basiliensis : printed at Bâle, 1541. A careful copy of Ald., in which a number of printer's errors are corrected and a few new ones introduced (Wimmer).

Cam. Editio Camotiana (or Aldina minor, altera) : printed at Venice, 1552. Also copied from Ald., but less carefully corrected than Bas.; the editor Camotius, in a few passages,

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altered the text to accord with Gaza's version.)

G. The Latin version of Theodore Gaza,¹ the Greek refugee: first printed at Treviso (Tarvisium) in 1483. A wonderful work for the time at which it appeared. Its present value is due to the fact that the translation was made from a different MS. to any now known. Unfortunately however this does not seem to have been a better text than that on which the Aldine edition was based. Moreover Gaza did not stick to his authority, but adopted freely Pliny's versions of Theophrastus, emending where he could not follow Pliny. There are several editions of Gaza's work: thus

G.Par.G.Bas. indicate respectively editions published at Paris in 1529 and at Bâle in 1534 and 1550. Wimmer has no doubt that the Tarvisian is the earliest edition, and he gives its readings, whereas Schneider often took those of G.Bas.

Vin.Vo.Cod.Cas. indicate readings which Schneider believed to have MS. authority, but which are really anonymous emendations from the margins of MSS. used by his predecessors, and all, in Wimmer's opinion

¹ See Sandys, *History of Classical Scholarship*, ii. p. 62, etc.

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traceable to Gaza's version. Schneider's so-called Codex Casauboni he knew, according to Wimmer, only from Hofmann's edition.

B. *Editions*

H. Editio Heinsii, printed at Leyden, 1613 : founded on Cam. and very carelessly printed, repeating the misprints of that edition and adding many others. In the preface Daniel Heins¹ pretends to have had access to a critical edition and to a Heidelberg MS. ; this claim appears to be entirely fictitious. The book indeed contains what Wimmer calls a *farrago emendationum*; he remarks that 'all the good things in it Heinsius owed to the wit of others, while all its faults and follies we owe to Heinsius.' Schneider calls it *editio omnium pessima*.

Bod. Editio Bodaei (viz. of Joannes Bodaeus à Stapel), printed at Amsterdam, 1644. The text of Heinsius is closely followed ; the margin contains a number of emendations taken from the margin of Bas. and from Scaliger, Robertus Constantinus, and Salmasius, with a few due to the editor himself. The commentary, according to Sir William Thiselton-Dyer, is 'botanically monumental and fundamental.'

¹ See Sandys, *op. cit.* p. 313 etc.

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St. Stackhouse, Oxford, 1813: a prettily printed edition with some illustrations; text founded on Ald. The editor seems to have been a fair botanist, but an indifferent scholar, though occasionally he hits on a certain emendation. The notes are short and generally of slight value. The book is however of interest, as being apparently the only work on the 'Enquiry' hitherto published in England.

Sch. J. G. Schneider (and Linck), Leipzig: vols. i.-iv. published in 1818, vol. v. in 1821; contains also the *περὶ αἰτῶν* and the fragments, and a reprint of Gaza's version (corrected). The fifth, or supplementary, volume, written during the author's last illness, takes account of the Codex Urbinas, which, unfortunately for Schneider, did not become known till his edition was finished. It is remarkable in how many places he anticipated by acute emendation the readings of U. The fifth volume also gives an account of criticisms of the earlier volumes by the eminent Greek Adamantios Koraës¹ and Kurt Sprengel. This is a monumental edition, despite the verbosity of the notes, somewhat careless references and reproduction of the MSS. readings, and an imperfect comprehension of the compressed style of Theophrastus, which leads to a good deal of wild emendation or rewriting of the text. For the first time we find an attempt at

¹ See Sandys, *op. cit.* iii. pp. 361 foll.

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providing a critical text, founded not on the Aldine edition, but on comparison of the manuscripts then known ; the Medicean and Viennese had been collated a few years before by J. Th. Schneider. We find also full use made of the ancient authors, Athenaeus, Plutarch, Pliny, Dioscorides, Nicander, Galen, etc., who quoted or adapted passages of Theophrastus, and copious references, often illuminating, to those who illustrate him, as Varro, Columella, Palladius, Aelian, the *Geponica*.

Spr. Kurt Sprengel, Halle, 1822. This is not an edition of the text, but a copious commentary with German translation. Sprengel was a better botanist than scholar ; Wimmer speaks disparagingly of his knowledge of Greek and of the translation. (See note prefixed to the Index of Plants.)

W. Fr. Wimmer : (1) An edition with introduction, analysis, critical notes, and Sprengel's identifications of the plant-names ; Breslau, 1842.

(2) A further revised text with new Latin translation, apparatus criticus, and full indices ; the Index Plantarum gives the identifications of Sprengel and Fraas ; Didot Library, Paris, n.d.

(3) A reprint of this text in Teubner's series, 1854.

These three books are an indispensable supplement to Schneider's great work. The notes in the edition of

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1842 are in the main critical, but the editor's remarks on the interpretation of thorny passages are often extremely acute, and always worth attention. The mass of material collected by Schneider is put into an accessible form. Wimmer is far more conservative in textual criticism than Schneider, and has a better appreciation of Theophrastus' elliptical and somewhat peculiar idiom, though some of his emendations appear to rest on little basis. A collation of the Paris MSS. (P and P₂) was made for Wimmer; for the readings of U and M he relied on Schneider, who, in his fifth volume, had compared U with Bodaeus' edition. A fresh collation of the rather exiguous manuscript authorities is perhaps required before anything like a definitive text can be provided. Wimmer's Latin translation is not very helpful, since it slurs the difficulties: the Didot edition, in which it appears, is disfigured with numerous misprints.

(Sandys' *History of Classical Scholarship* (ii. p. 380) mentions translations into Latin and Italian by Bandini; of this work I know nothing.)

C. Other Commentators

Scal. J. C. Scaliger: *Commentarii et animadversiones* on the *περὶ φυτῶν ιστορία* posthumously published by his son Sylvius at Leyden, 1584. (He also wrote a commentary on the *περὶ αἰτιῶν*, which was edited by Robertus Constantinus and pub-

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lished at Geneva in 1566.) The most accurate and brilliant scholar who has contributed to the elucidation of Theophrastus.

R. Const. Robertus Constantinus (see above). Added notes of his own, many of them valuable, which are given with Scaliger's in Bodaeus' edition.

Salm. Salmasius (Claude de Saumaise). Made many happy corrections of Theophrastus' text in his *Exercitationes Plinianae*.

Palm. Jacobus Palmerius (Jacques de Paulmier). His *Exercitationes in optimos auctores Graecos* (Leyden, 1668) contain a certain number of acute emendations; Wimmer considers that he had a good understanding of Theophrastus' style.

Meurs. Johannes Meursius (Jan de Meurs). Author of some critical notes on Theophrastus published at Leyden in 1640; also of a book on Crete.

Dalec. Jean Jacques D'Aléchamps: the botanist. Author of *Historia plantarum universalis*, Lyons, 1587, and editor of Pliny's *Natural History*.

Mold. J. J. P. Moldenhauer. Author of *Tentamen in Historiam plantarum Theophrasti*, Hamburg, 1791. This book, which I have not been able to see and know only from Wimmer's citations, contains, according to him, very valuable notes on the extremely difficult Introduction to the 'Historia' (Book I. chaps. i.-ii.).

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II.—THEOPHRASTUS' LIFE AND WORKS

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Such information as we possess concerning the life of Theophrastus comes mainly from Diogenes Laertius' *Lives of the Philosophers*, compiled at least four hundred years after Theophrastus' death; it is given therefore here for what it may be worth; there is no intrinsic improbability in most of what Diogenes records.

He was born in 370 b.c. at Eresos in Lesbos; at an early age he went to Athens and there became a pupil of Plato. It may be surmised that it was from him that he first learnt the importance of that principle of classification which runs through all his extant works, including even the brochure known as the 'Characters' (if it is rightly ascribed to him), and which is ordinarily considered as characteristic of the teaching of his second master Aristotle. But in Plato's own later speculations classification had a very important place, since it was by grouping things in their 'natural kinds' that, according to his later metaphysic, men were to arrive at an adumbration of the 'ideal forms' of which these kinds are the phenomenal counterpart, and which constitute the world of reality. Whether Theophrastus gathered the principle of classification from Plato or from his fellow-pupil Aristotle, it appears in his hands to have been for the first time systematically applied to the vegetable world. Throughout his botanical

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works the constant implied question is ‘What is its *difference?*’, ‘What is its essential nature?’, viz. ‘What are the characteristic features in virtue of which a plant may be distinguished from other plants, and which make up its own ‘nature’ or essential character?

Theophrastus appears to have been only Aristotle’s junior by fifteen years. On Plato’s death he became Aristotle’s pupil, but, the difference in age not being very great, he and his second master appear to have been on practically equal terms. We are assured that Aristotle was deeply attached to his friend; while as earnest of an equally deep attachment on the other side Theophrastus took Aristotle’s son under his particular care after his father’s death. Aristotle died at the age of sixty-three, leaving to his favourite pupil his books, including the autographs of his own works, and his garden in the grounds of the Lyceum. The first of these bequests, if the information is correct, is of great historical importance; it may well be that we owe to Theophrastus the publication of some at least of his master’s voluminous works. And as to the garden it is evident that it was here that the first systematic botanist made many of the observations which are recorded in his botanical works. Diogenes has preserved his will, and there is nothing in the terms of this interesting document to suggest that it is not authentic. Of special interest is the provision made for the maintenance of the garden;

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it is bequeathed to certain specified friends and to those who will spend their time with them in learning and philosophy ; the testator is to be buried in it without extravagant expense, a custodian is appointed, and provision is made for the emancipation of various gardeners, so soon as they have earned their freedom by long enough service.

According to Diogenes Theophrastus died at the age of eighty-five. He is made indeed to say in the probably spurious Preface to the 'Characters' that he is writing in his ninety-ninth year; while St. Jerome's Chronicle asserts that he lived to the age of 107. Accepting Diogenes' date, we may take it that he died about 285 B.C. ; it is said that he complained that "we die just when we are beginning to live." His life must indeed have been a remarkably full and interesting one, when we consider that he enjoyed the personal friendship of two such men as Plato and Aristotle, and that he had witnessed the whole of the careers of Philip and Alexander of Macedon. To Alexander indeed he was directly indebted ; the great conqueror had not been for nothing the pupil of the encyclopaedic Aristotle. He took with him to the East scientifically trained observers, the results of whose observations were at Theophrastus' disposal. Hence it is that his descriptions of plants are not limited to the flora of Greece and the Levant; to the reports of Alexander's followers he owed his accounts of such plants as the cotton-plant, banyan, pepper, cinnamon, myrrh and

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frankincense. It has been a subject of some controversy whence he derived his accounts of plants whose habitat was nearer home. Kirchner, in an able tract, combats the contention of Sprengel that his observations even of the Greek flora were not made at first hand. Now at this period the Peripatetic School must have been a very important educational institution ; Diogenes says that under Theophrastus it numbered two thousand pupils. Moreover we may fairly assume that Alexander, from his connexion with Aristotle, was interested in it, while we are told that at a later time Demetrius Phalereus assisted it financially. May we not hazard and guess that a number of the students were appropriately employed in the collection of facts and observations ? The assumption that a number of 'travelling students' were so employed would at all events explain certain references in Theophrastus' botanical works. He says constantly 'The Macedonians say,' 'The men of Mount Ida say' and so forth. Now it seems hardly probable that he is quoting from written treatises by Macedonian or Idaean writers. It is at least a plausible suggestion that in such references he is referring to reports of the districts in question contributed by students of the school. In that case 'The Macedonians say' would mean 'This is what our representative was told in Macedonia.' It is further noticeable that the tense used is sometimes past, e.g. 'The men of Mount Ida *said*' ; an obvious explanation of this is

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supplied by the above conjecture. It is even possible that in one place (3. 12. 4.) the name of one of these students has been preserved.

Theophrastus, like his master, was a very voluminous writer ; Diogenes gives a list of 227 treatises from his pen, covering most topics of human interest, as Religion, Politics, Ethics, Education, Rhetoric, Mathematics, Astronomy, Logic, Meteorology and other natural sciences. His oratorical works enjoyed a high reputation in antiquity. Diogenes attributes to him ten works on Rhetoric, of which one *On Style* was known to Cicero, who adopted from it the classification of styles into the 'grand,' the 'plain,' and the 'intermediate.'¹ Of one or two other lost works we have some knowledge. Thus the substance of an essay on Piety is preserved in Porphyry *de Abstinentia*.² The principal works still extant are the nine books of the Enquiry into Plants, and the six books on the Causes of Plants ; these seem to be complete. We have also considerable fragments of treatises entitled :—of Sense-perception and objects of Sense, of Stones, of Fire, of Odours, of Winds, of Weather-Signs, of Weariness, of Dizziness, of Sweat, Metaphysics, besides a number of unassigned excerpts. The style of these works, as of the botanical books, suggests that, as in the case of Aristotle, what we possess consists of notes for lectures or notes taken of lectures. There is no literary charm ; the sen-

¹ Sandys, i. p. 99.

² Bernays, *Theophrastus*, 1866.

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tences are mostly compressed and highly elliptical, to the point sometimes of obscurity. It follows that translation, as with Aristotle, must be to some extent paraphrase. The thirty sketches of 'Characters' ascribed to Theophrastus, which have found many imitators, and which are well known in this country through Sir R. Jebb's brilliant translation, stand on a quite different footing ; the object of this curious and amusing work is discussed in Sir R. Jebb's Introduction and in the more recent edition of Edmonds and Austen. Well may Aristotle, as we are assured, have commended his pupil's diligence. It is said that, when he retired from the headship of the school, he handed it over to Theophrastus. We are further told that the latter was once prosecuted for impiety, but the attack failed ; also that he was once banished from Athens for a year, it does not appear under what circumstances. He was considered an attractive and lively lecturer. Diogenes' sketch ends with the quotation of some sayings attributed to him, of which the most noteworthy are 'Nothing costs us so dear as the waste of time,' 'One had better trust an unbridled horse than an undigested harangue.' He was followed to his grave, which we may hope was, in accordance with his own wish, in some peaceful corner of the Lyceum garden, by a great assemblage of his fellow townsmen.

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The principal references in the notes are to the following ancient authors :—

Apollon. Apollonius, *Historia Miraculorum*.
Arist. Aristotle. Bekker, Berlin, 1831.
Arr. Arrian. Hercher (Teubner).
Athen. Athenaeus. Dindorf, Leipzig, 1827.
Col. Columella, *de re rustica*. Schneider, Leipzig, 1794.
Diod. Diodorus.
Diosc. Pedanius Dioscorides, *de materia medica*. Wellmann, Berlin, 1907.
Geop. Geoponica. Beckh (Teubner), 1895.
Nic. Nicander, *Theriaca*. Schneider, Leipzig, 1816.
Pall. Palladius, *de re rustica*. Schneider, Leipzig, 1795.
Paus. Pausanias. Schubart (Teubner), Leipzig, 1881.
Plin. Plinius, *Naturalis Historia*. Mayhoff (Teubner), 1887. (Reference by book and section.)
Plut. Plutarch. Hercher (Teubner), Leipzig, 1872.
Scyl. Scylax, *Periplus*. Vossius, Amsterdam, 1639.

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THEOPHRASTUS
ENQUIRY INTO PLANTS
BOOK I

VOL. I.

B

ΘΕΟΦΡΑΣΤΟΥ

ΠΕΡΙ ΦΤΤΩΝ ΙΣΤΟΡΙΑΣ

Α

Ι. Τῶν φυτῶν τὰς διαφορὰς καὶ τὴν ἄλλην φύσιν ληπτέον κατά τε τὰ μέρη καὶ τὰ πάθη καὶ τὰς γενέσεις καὶ τοὺς βίους· ἥθη γὰρ καὶ πράξεις οὐκ ἔχουσιν ὕσπερ τὰ ζῶα. εἰσὶ δὲ αἱ μὲν κατὰ τὴν γένεσιν καὶ τὰ πάθη καὶ τοὺς βίους εὐθεωρητότεραι καὶ ῥάους, αἱ δὲ κατὰ τὰ μέρη πλείους ἔχουσι ποικιλίας. αὐτὸς γὰρ τοῦτο πρῶτον οὐχ ἴκανῶς ἀφώρισται τὰ ποῖα δεῖ μέρη καὶ μὴ μέρη καλεῖν, ἀλλ' ἔχει τινὰ ἀπορίαν.

2 Τὸ μὲν οὖν μέρος ἄτε ἐκ τῆς ἴδιας φύσεως ὃν ἀεὶ δοκεῖ διαμένειν ἢ ἀπλῶς ἢ ὅταν γένηται, καθάπερ ἐν τοῖς ζώοις τὰ ὑστερον γενησόμενα, πλὴν εἴ τι

¹ τὰ ins. Sch., om. Ald. H.

² πάθη, a more general word than δυνάμεις, ‘virtues’: cf. 1. 5. 4; 8. 4. 2; it seems to mean here something like ‘behaviour,’ in relation to environment. Instances of πάθη are given 4. 2. 11; 4. 14. 6.

³ ἔχουσι conj. H.; ἔχουσαι W. with Ald.

THEOPHRASTUS ENQUIRY INTO PLANTS

BOOK I

OF THE PARTS OF PLANTS AND THEIR COMPOSITION. OF CLASSIFICATION.

Introductory: How plants are to be classified; difficulty of defining what are the essential 'parts' of a plant especially if plants are assumed to correspond to animals.

I. IN considering the distinctive characters of plants and their nature generally one must take into account their¹ parts, their qualities,² the ways in which their life originates, and the course which it follows in each case: (conduct and activities we do not find in them, as we do in animals). Now the differences in the way in which their life originates, in their qualities and in their life-history are comparatively easy to observe and are simpler, while those shewn³ in their 'parts' present more complexity. Indeed it has not even been satisfactorily determined what ought and what ought not to be called 'parts,' and some difficulty is involved in making the distinction.

Now it appears that by a 'part,' seeing that it is something which belongs to the plant's characteristic nature, we mean something which is permanent either absolutely or when once it has appeared (like those parts of animals which remain for a time undeveloped)

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διὰ τόσαν ἡ γῆρας ἡ πήρωσιν ἀποβάλλεται. τῶν δ' ἐν τοῖς φυτοῖς ἔνια τοιαῦτ' ἐστὶν ὥστ' ἐπέτειον ἔχειν τὴν οὐσίαν, οἷον ἄνθος βρύον φύλλον καρπός, ἀπλῶς ὅσα πρὸ τῶν καρπῶν ἡ ἄμα γίνεται τοῖς καρποῖς· ἔτι δὲ αὐτὸς ὁ βλαστός· αἱὲ γὰρ ἐπίφυσιν λαμβάνει τὰ δένδρα κατ' ἐνιαυτὸν ὁμοίως ἐν τε τοῖς ἄνω καὶ ἐν τοῖς περὶ τὰς ῥίζας· ὥστε, εἰ μέν τις ταῦτα θήσει μέρη, τό τε πλῆθος ἀόριστον ἔσται καὶ οὐδέποτε τὸ αὐτὸν μορίων· εἰ δ' αὖ μὴ μέρη, συμβήσεται, δι' ὧν τέλεια γίνεται καὶ φαίνεται, ταῦτα μὴ εἶναι μέρη· βλαστάνοντα γὰρ καὶ θάλλοντα καὶ καρπὸν ἔχοντα πάντα καλλίω καὶ τελειότερα καὶ δοκεῖ καὶ ἔστιν. αἱ μὲν οὖν ἀπορίαι σχεδόν εἰσιν αὗται.

3 Τάχα δὲ οὐχ ὁμοίως ἅπαντα ζητητέον οὕτε ἐν τοῖς ἄλλοις οὕθ' ὅσα πρὸς τὴν γένεσιν, αὐτά τε τὰ γεννώμενα μέρη θετέον οἷον τοὺς καρπούς. οὐδὲ γὰρ τὰ ἔμβρυα τῶν ζώων. εἰ δὲ ἐν τῇ ὥρᾳ ὅψει τοῦτό γε κάλλιστον,

¹ i.e. the male inflorescence of some trees; the term is of course wider than 'catkin.'

² i.e. flower, catkin, leaf, fruit, shoot.

ENQUIRY INTO PLANTS, I. I. 2-3

—permanent, that is, unless it be lost by disease, age or mutilation. However some of the parts of plants are such that their existence is limited to a year, for instance, flower, 'catkin,'¹ leaf, fruit, in fact all those parts which are antecedent to the fruit or else appear along with it. Also the new shoot itself must be included with these; for trees always make fresh growth every year alike in the parts above ground and in those which pertain to the roots. So that if one sets these² down as 'parts,' the number of parts will be indeterminate and constantly changing; if on the other hand these are not to be called 'parts,' the result will be that things which are essential if the plant is to reach its perfection, and which are its conspicuous features, are nevertheless not 'parts'; for any plant always appears to be, as indeed it is, more comely and more perfect when it makes new growth, blooms, and bears fruit. Such, we may say, are the difficulties involved in defining a 'part.'

But perhaps we should not expect to find in plants a complete correspondence with animals in regard to those things which concern reproduction any more than in other respects; and so we should reckon as 'parts' even those things to which the plant gives birth, for instance their fruits, although³ we do not so reckon the unborn young of animals. (However, if such⁴ a product seems fairest to the eye, because the plant is then in its prime, we can draw no inference from this in

³ οὐδὲ γὰρ: οὐδὲ seems to mean no more than οὐ (cf. *neque enim*=*non enim*); γὰρ refers back to the beginning of the §.

⁴ ἐν τῇ ὥρᾳ ὅψει τυῦτό γε I conj.; τῇ ὥρᾳ ὅψει τό γε vulg. W.; τοῦτο, i.e. flower or fruit.

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οὐδὲν σημεῖον, ἐπεὶ καὶ τῶν ζώων εὐθενεῖ τὰ κύοντα.

Πολλὰ δὲ καὶ τὰ μέρη κατ' ἐνιαυτὸν ἀποβάλλει, καθάπερ οἵ τε ἔλαφοι τὰ κέρατα καὶ τὰ φωλεύοντα τὰ πτερὰ καὶ τρίχας τετράποδα· ὥστ' οὐδὲν ἄτοπον ἄλλως τε καὶ ὅμοιον ὃν τῷ φυλλοβολεῖν τὸ πάθος.

‘Ωσαύτως δ’ οὐδὲ τὰ πρὸς τὴν γένεσιν ἐπεὶ καὶ ἐν τοῖς ζώοις τὰ μὲν συνεκτίκτεται τὰ δ’ ἀποκαθαίρεται καθάπερ ἀλλότρια τῆς φύσεως. ἔοικε δὲ παραπλησίως καὶ τὰ περὶ τὴν βλάστησιν ἔχειν. ἡ γάρ τοι βλάστησις γενέσεως χάριν ἐστὶ τῆς τελείας.

4 “Ολως δὲ καθάπερ εἴπομεν οὐδὲ πάντα ὄμοιώς καὶ ἐπὶ τῶν ζώων ληπτέον. δι’ δὲ καὶ ὁ ἀριθμὸς ἀόριστος· πανταχῆ γὰρ βλαστητικὸν ἄτε καὶ πανταχῆ ζῶν. ὥστε ταῦτα μὲν οὕτως ὑποληπτέον οὐ μόνον εἰς τὰ νῦν ἀλλὰ καὶ τῶν μελλόντων χάριν· ὅσα γὰρ μὴ οἶν τε ἀφομοιοῦν περίεργον τὸ γλίχεσθαι πάντως, ἵνα μὴ καὶ τὴν οἰκείαν ἀποβάλλωμεν θεωρίαν. ἡ δὲ ἴστορία τῶν φυτῶν ἐστιν ὡς ἀπλῶς εἰπεῖν ἡ κατὰ

¹ εὐθενεῖ conj. Sch., εὐθετεῖ UΜVALd. i.e. we do not argue from the fact that animals are at their handsomest in the breeding season that the young is therefore ‘part’ of the animal.

² Lit. ‘which are in holes,’ in allusion to the well-known belief that animals (especially birds) which are out of sight in the winter are hiding in holes; the text is supported by [Arist.] *de plantis* 1. 3, the author of which had evidently read this passage; but possibly some such words as τὰς τε φολίδας καὶ have dropped out after φωλεύοντα.

ENQUIRY INTO PLANTS, I. L 3-4

support of our argument, since even among animals those that are with young are at their best.¹⁾

Again many plants shed their parts every year, even as stags shed their horns, birds which hibernate² their feathers, four-footed beasts their hair: so that it is not strange that the parts of plants should not be permanent, especially as what thus occurs in animals and the shedding of leaves in plants are analogous processes.

In like manner the parts concerned with reproduction are not permanent in plants; for even in animals there are things which are separated from the parent when the young is born, and there are other things³ which are cleansed away, as though neither of these belonged to the animal's essential nature. And so too it appears to be with the growth of plants; for of course growth leads up to reproduction as the completion of the process.⁴

And in general, as we have said, we must not assume that in all respects there is complete correspondence between plants and animals. And that is why the number also of parts is indeterminate; for a plant has the power of growth in all its parts, inasmuch as it has life in all its parts. Wherefore we should assume the truth to be as I have said, not only in regard to the matters now before us, but in view also of those which will come before us presently; for it is waste of time to take great pains to make comparisons where that is impossible, and in so doing we may lose sight also of our proper subject of enquiry. The enquiry into plants, to put it generally, may

³ i.e. the embryo is not the only thing derived from the parent animal which is not a 'part' of it; there is also the food-supply produced with the young, and the after-birth.

⁴ cf. C.P. I. 11. 8.

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τὰ ἔξω μόρια καὶ τὴν ὅλην μορφὴν ἡ κατὰ τὰ
ἐντός, ὥσπερ ἐπὶ τῶν ζώων τὰ ἐκ τῶν ἀνατομῶν.

5 Ληπτέον δ' ἐν αὐτοῖς ποῖα τε πᾶσιν ὑπάρχει
ταῦτα καὶ ποῖα ἵδια καθ' ἔκαστον γένος, ἔτι δὲ
τῶν αὐτῶν ποῖα ὅμοια· λέγω δ' οἰν φύλλον ῥίζα
φλοιός. οὐδεὶς δὲ οὐδὲ τοῦτο λανθάνειν εἴ τι κατ'
ἀναλογίαν θεωρητέον, ὥσπερ ἐπὶ τῶν ζώων, τὴν
ἀναφορὰν ποιουμένους δῆλον ὅτι πρὸς τὰ ἐμ-
φερέστατα καὶ τελειότατα. καὶ ἀπλῶς δὲ ὅσα
τῶν ἐν φυτοῖς ἀφομοιωτέον τῷ ἐν τοῖς ζώοις, ὡς
ἂν τίς τῷ γ' ἀνάλογον ἀφομοιοῖ. ταῦτα μὲν οὖν
διωρίσθω τὸν τρόπον τοῦτον.

6 Αἱ δὲ τῶν μερῶν διαφορὰὶ σχεδὸν ὡς τύπῳ
λαβεῖν εἰσιν ἐν τρισίν, ἡ τῷ τὰ μὲν ἔχειν
τὰ δὲ μή, καθάπερ φύλλα καὶ καρπόν, ἡ τῷ
μὴ ὅμοια μηδὲ ἵσα, ἡ τρίτον τῷ μὴ ὅμοίως.
τούτων δὲ ἡ μὲν ἀνομοιότης ὁρίζεται σχήματι
χρώματι πυκνότητι μανότητι τραχύτητι λειότητι
καὶ τοῖς ἄλλοις πάθεσιν, ἔτι δὲ ὅσαι διαφοραὶ
τῶν χυλῶν. ἡ δὲ ἀνισότης ὑπεροχῇ καὶ ἐλλείψει
κατὰ πλῆθος ἡ μέγεθος. ὡς δ' εἰπεῖν τύπῳ

¹ A very obscure sentence; so W. renders the MSS. text.

² i.e. 'inequality' might include 'unlikeness.'

ENQUIRY INTO PLANTS, I. I. 4-6

either take account of the external parts and the form of the plant generally, or else of their internal parts: the latter method corresponds to the study of animals by dissection.

Further we must consider which parts belong to all plants alike, which are peculiar to some one kind, and which of those which belong to all alike are themselves alike in all cases; for instance, leaves roots bark. And again, if in some cases analogy ought to be considered (for instance, an analogy presented by animals), we must keep this also in view; and in that case we must of course make the closest resemblances and the most perfectly developed examples our standard;¹ and, finally, the ways in which the parts of plants are affected must be compared to the corresponding effects in the case of animals, so far as one can in any given case find an analogy for comparison. So let these definitions stand.

The essential parts of plants, and the materials of which they are made.

Now the differences in regard to parts, to take a general view, are of three kinds: either one plant may possess them and another not (for instance, leaves and fruit), or in one plant they may be unlike in appearance or size to those of another, or, thirdly, they may be differently arranged. Now the unlikeness between them is seen in form, colour, closeness of arrangement or its opposite, roughness or its opposite, and the other qualities; and again there are the various differences of flavour. The inequality is seen in excess or defect as to number or size, or, to speak generally,² all the above-mentioned differences too

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κάκεῖνα πάντα καθ' ὑπεροχὴν καὶ ἔλλειψιν· τὸ
 7 γὰρ μᾶλλον καὶ ἡττον ὑπεροχὴ καὶ ἔλλειψις· τὸ
 δὲ μὴ ὁμοίως τῇ θέσει διαφέρει· λέγω δ' οἶν τὸ
 τοὺς καρποὺς τὰ μὲν ἐπάνω τὰ δὲ ὑποκάτω τῶν
 φύλλων ἔχειν καὶ αὐτοῦ τοῦ δένδρου τὰ μὲν ἔξ
 ἄκρου τὰ δὲ ἐκ τῶν πλαγίων, ἔνια δὲ καὶ ἐκ τοῦ
 στελέχους, οἶν ἡ Αἰγυπτία συκάμινος, καὶ ὅσα δὴ
 καὶ ὑπὸ γῆς φέρει καρπόν, οἶν ἡ τε ἀραχίδνα καὶ
 τὸ ἐν Αἰγύπτῳ καλούμενον οὕνηγον, καὶ εἰ τὰ μὲν
 ἔχει μίσχον τὰ δὲ μή. καὶ ἐπὶ τῶν ἀνθέων ὁμοίως·
 τὰ μὲν γὰρ περὶ αὐτὸν τὸν καρπὸν τὰ δὲ ἄλλως.
 ὅλως δὲ τὸ τῆς θέσεως ἐν τούτοις καὶ τοῖς φύλλοις
 καὶ ἐν τοῖς βλαστοῖς ληπτέον.

8 Διαφέρει δὲ ἔνια καὶ τῇ τάξει· τὰ μὲν ὡς
 ἔτυχε, τῆς δὲ ἐλάτης οἱ κλῶνες κατ' ἄλλήλους
 ἐκατέρωθεν· τῶν δὲ καὶ οἱ ὅξοι δι' ἵσου τε καὶ
 κατ' ἀριθμὸν ἵσοι, καθάπερ τῶν τριόζων.

"Ωστε τὰς μὲν διαφορὰς ἐκ τούτων ληπτέον ἔξ
 ὧν καὶ ἡ ὅλη μορφὴ συνδηλοῦται καθ' ἔκαστον.

9 Αὐτὰ δὲ τὰ μέρη διαριθμησαμένους πειρατέον
 περὶ ἔκαστου λέγειν. ἔστι δὲ πρῶτα μὲν καὶ
 μέγιστα καὶ κοινὰ τῶν πλείστων τάδε, ρίζα
 καυλὸς ἀκρεμῶν κλάδος, εἰς ἀ διέλοιτ' ἄν τις

¹ cf. C.P. 5. 1. 9.

² cf. 1. 6. 11. T. extends the term *καρπός* so as to include any succulent edible part of a plant.

³ T. does not consider that *καρπός* was necessarily anteceded by a flower.

ENQUIRY INTO PLANTS, I. I. 6-9

are included under excess and defect: for the 'more' and the 'less' are the same thing as excess and defect, whereas 'differently arranged' implies a difference of position; for instance, the fruit may be above or below the leaves,¹ and, as to position on the tree itself, the fruit may grow on the apex of it or on the side branches, and in some cases even on the trunk, as in the sycamore; while some plants again even bear their fruit underground, for instance *arakhidna*² and the plant called in Egypt *wingon*; again in some plants the fruit has a stalk, in some it has none. There is a like difference in the floral organs: in some cases they actually surround the fruit, in others they are differently placed³: in fact it is in regard to the fruit, the leaves, and the shoots that the question of position has to be considered.

Or again there are differences as to symmetry⁴: in some cases the arrangement is irregular, while the branches of the silver-fir are arranged opposite one another; and in some cases the branches are at equal distances apart, and correspond in number, as where they are in three rows.⁵

Wherefore the differences between plants must be observed in these particulars, since taken together they shew forth the general character of each plant.

But, before we attempt to speak about each, we must make a list of the parts themselves. Now the primary and most important parts, which are also common to most, are these—root, stem, branch, twig; these are the parts into which we might divide the plant, regarding them as members,⁶ corresponding to

¹ Plin. 16. 122.

⁵ i.e. ternate.

⁶ i.e. if we wished to make an anatomical division. μέλη conj. Sch. cf. 1. 2. 7; μέρη Ald.

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ώσπερ εὶς μέλη, καθάπερ ἐπὶ τῶν ζώων. ἔκαστον τε γὰρ ἀνόμοιον καὶ ἐξ ἀπάντων τούτων τὰ ὅλα.

"Εστι δὲ ρίζα μὲν δι' οὐ τὴν τροφὴν ἐπάγεται, καυλὸς δὲ εὶς ὃ φέρεται. καυλὸν δὲ λέγω τὸ ὑπὲρ γῆς πεφυκὸς ἐφ' ἐν· τοῦτο γὰρ κοινότατον ὄμοίως ἐπετείοις καὶ χρονίοις, ὃ ἐπὶ τῶν δένδρων καλεῖται στέλεχος· ἀκρεμόνας δὲ τοὺς ἀπὸ τούτου σχιζομένους, οὓς ἔνιοι καλοῦσιν ὅζους. κλάδον δὲ τὸ βλάστημα τὸ ἐκ τούτων ἐφ' ἐν, οἷον μάλιστα τὸ ἐπέτειον.

Καὶ ταῦτα μὲν οἰκειότερα τῶν δένδρων.
 10 ὁ δὲ καυλός, ὡσπερ εἴρηται, κοινότερος· ἔχει δὲ οὐ πάντα οὐδὲ τοῦτον, οἷον ἔνια τῶν ποιωδῶν. τὰ δ' ἔχει μὲν οὐκ ἀεὶ δὲ ἀλλ' ἐπέτειον, καὶ ὅσα χρονιώτερα ταῖς ρίζαις. ὅλως δὲ πολύχον τὸ φυτὸν καὶ ποικίλον καὶ χαλεπὸν εἰπεῖν καθόλου· σημεῖον δὲ τὸ μηδὲν εἶναι κοινὸν λαβεῖν ὃ πᾶσιν ὑπάρχει, καθάπερ τοῖς ζώοις
 11 στόμα καὶ κοιλία. τὰ δὲ ἀναλογίᾳ ταῦτα τὰ δ' ἄλλον τρόπον. οὔτε γὰρ ρίζαν πάντ' ἔχει οὔτε καυλὸν οὔτε ἀκρεμόνα οὔτε κλάδον οὔτε φύλλον οὔτε ἄνθος οὔτε καρπὸν οὔτ' αὖ φλοιὸν ἢ μήτραν ἢ ἴνας ἢ φλέβας, οἷον μύκης ὕδνον· ἐν τούτοις δὲ ἡ οὐσία καὶ ἐν τοῖς τοιούτοις· ἀλλὰ μάλιστα ταῦτα

¹ i.e. before it begins to divide.

² Or 'knots.'

³ ἐφ' conj. W.; ὑφ' P₂P₃Ald.

⁴ χρονιώτερα conj. Sch.; χρονιώτερον Ald.H.

⁵ ἀναλογίᾳ conj. Sch.; ἀναλογία U Ald.H.

the members of animals : for each of these is distinct in character from the rest, and together they make up the whole.

The root is that by which the plant draws its nourishment, the stem that to which it is conducted. And by the 'stem' I mean that part which grows above ground and is single¹; for that is the part which occurs most generally both in annuals and in long-lived plants ; and in the case of trees it is called the 'trunk.' By 'branches' I mean the parts which split off from the stem and are called by some 'boughs.'² By 'twig' I mean the growth which springs from the branch regarded as a single whole,³ and especially such an annual growth.

Now these parts belong more particularly to trees. The stem however, as has been said, is more general, though not all plants possess even this, for instance, some herbaceous plants are stemless ; others again have it, not permanently, but as an annual growth, including some whose roots live beyond the year.⁴ In fact your plant is a thing various and manifold, and so it is difficult to describe in general terms : in proof whereof we have the fact that we cannot here seize on any universal character which is common to all, as a mouth and a stomach are common to all animals ; whereas in plants some characters are the same in all, merely in the sense that all have analogous⁵ characters, while others correspond otherwise. For not all plants have root, stem, branch, twig, leaf, flower or fruit, or again bark, core, fibres or veins ; for instance, fungi and truffles ; and yet these and such like characters belong to a plant's essential nature. However, as has been said, these

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ὑπάρχει, καθάπερ εἴρηται, τοῖς δένδροις κάκείνων οἰκειότερος ὁ μερισμός. πρὸς ἀ καὶ τὴν ἀναφορὰν τῶν ἄλλων ποιεῖσθαι δίκαιον.

12 Σχεδὸν δὲ καὶ τὰς ἄλλας μορφὰς ἑκάστων ταῦτα διασημαίνει. διαφέρουσι γὰρ πλήθει τῷ τούτων καὶ ὀλιγότητι καὶ πυκνότητι καὶ μανότητι καὶ τῷ ἐφ' ἐν ἦ εἰς πλείω σχίζεσθαι καὶ τοῖς ἄλλοις τοῖς ὁμοίοις. ἔστι δὲ ἔκαστον τῶν εἰρημένων οὐχ ὁμοιομερές· λέγω δὲ οὐχ ὁμοιομερές ὅτι ἐκ τῶν αὐτῶν μὲν ὅτιοῦν μέρος σύγκειται τῆς ρίζης καὶ τοῦ στελέχους, ἀλλ' οὐ λέγεται στέλεχος τὸ ληφθὲν ἄλλὰ μόριον, ὡς ἐν τοῖς τῶν ζώων μέλεσίν ἔστιν. ἐκ τῶν αὐτῶν μὲν γὰρ ὅτιοῦν τῆς κυνήμης ἡ τοῦ ἀγκῶνος, οὐχ ὁμώνυμον δὲ καθάπερ σάρξ καὶ ὄστοῦν, ἀλλ' ἀνώνυμον· οὐδὲ δὴ τῶν ἄλλων οὐδενὸς ὅσα μονοειδῆ τῶν ὀργανικῶν· ἀπάντων γὰρ τῶν τοιούτων ἀνώνυμα τὰ μέρη. τῶν δὲ πολυειδῶν ὀνομασμένα καθάπερ ποδὸς χειρὸς κεφαλῆς, οἷον δάκτυλος ρὶς ὀφθαλμός. καὶ τὰ μὲν μέγιστα μέρη σχεδὸν ταῦτά ἔστιν.

II. Ἀλλα δὲ ἔξ ὧν ταῦτα φλοιὸς ξύλον μήτρα, ὅσα ἔχει μήτραν. πάντα δ' ὁμοιομερῆ. καὶ τὰ τούτων δὲ ἔτι πρότερα καὶ ἔξ ὧν ταῦτα, ὑγρὸν ἴσ-

¹ There is no exact English equivalent for *δμοιομερές*, which denotes a whole composed of parts, each of which is, as it were, a miniature of the whole. cf. Arist. *H.A.* 1. 1.

² i.e. any part taken of flesh or bone may be called 'flesh' or 'bone.'

³ e.g. bark ; cf. 1. 2. 1.

⁴ e.g. fruit.

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characters belong especially to trees, and our classification of characters belongs more particularly to these; and it is right to make these the standard in treating of the others.

Trees moreover shew forth fairly well the other features also which distinguish plants; for they exhibit differences in the number or fewness of these which they possess, as to the closeness or openness of their growth, as to their being single or divided, and in other like respects. Moreover each of the characters mentioned is not 'composed of like parts'¹; by which I mean that though any given part of the root or trunk is composed of the same elements as the whole, yet the part so taken is not itself called 'trunk,' but 'a portion of a trunk.' The case is the same with the members of an animal's body; to wit, any part of the leg or arm is composed of the same elements as the whole, yet it does not bear the same name (as it does in the case of flesh or bone²); it has no special name. Nor again have subdivisions of any of those other organic parts³ which are uniform special names, subdivisions of all such being nameless. But the subdivisions of those parts⁴ which are compound have names, as have those of the foot, hand, and head, for instance, toe, finger, nose or eye. Such then are the largest⁵ parts of the plant.

II. Again there are the things of which such parts are composed, namely bark, wood, and core (in the case of those plants which have it⁶), and these are all 'composed of like parts.' Further there are the things which are even prior to these, from which

⁵ i.e. the 'compound' parts.

⁶ ξύλον μήτρα conj. W. from G. μήτρα ξύλον MSS. ; ξύλον, δσα conj. W. ; ξύλα, ή δσα Ald.H.

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φλὲψ σάρξ· ἀρχαὶ γὰρ αὗται πλὴν εἴ τις λέγοι τὰς τῶν στοιχείων δυνάμεις, αὗται δὲ κοιναὶ πάντων. ή μὲν οὖν οὐσία καὶ ή ὅλη φύσις ἐν τούτοις.

"Αλλα δ' ἐστὶν ὕσπερ ἐπέτεια μέρη τὰ πρὸς τὴν καρποτοκίαν, οἷον φύλλου ἄνθος μίσχος· τοῦτο δ' ἐστὶν ὃ συνήρτηται πρὸς τὸ φυτὸν τὸ φύλλου καὶ ὁ καρπός· ἔτι δὲ [ἔλιξ] βρύον, οἷς ὑπάρχει, καὶ ἐπὶ πᾶσι σπέρμα τὸ τοῦ καρποῦ· καρπὸς δ' ἐστὶ τὸ συγκείμενον σπέρμα μετὰ τοῦ περικαρπίου. παρὰ δὲ ταῦτα ἐνίων ἕδια ἄττα, καθάπερ ή κηκὶς δρυὸς καὶ ή ἔλιξ ἀμπέλου.

2 Καὶ τοῖς μὲν δένδρεσιν ἔστιν οὕτως διαλαβεῖν. τοῖς δ' ἐπετείοις δῆλον ὡς ἀπαντα ἐπέτεια· μέχρι γὰρ τῶν καρπῶν ή φύσις. ὅσα δὴ ἐπετείοκαρπα καὶ ὅσα διετίζει, καθάπερ σέλινον καὶ ἄλλ' ἄττα, καὶ ὅσα δὲ πλείω χρόνον ἔχει, τούτοις ἀπασι καὶ ὁ καυλὸς ἀκολουθήσει κατὰ λόγου· ὅταν γὰρ σπερμοφορεῖν μέλλωσι, τότε ἐκκαυλοῦσιν, ὡς ἔνεκα τοῦ σπέρματος ὅντων τῶν καυλῶν.

Ταῦτα μὲν οὖν ταύτη διηρήσθω. τῶν δὲ ἄρτι εἰρημένων μερῶν πειρατέον ἔκαστον εἰπεῖν τί ἔστιν ὡς ἐν τύπῳ λέγοντας.

3 Τὸ μὲν οὖν ὑγρὸν φανερόν· δ δὴ καλοῦσί τινες ἀπλῶς ἐν ἀπασιν ὁπόν, ὕσπερ καὶ Μενέστωρ, οἱ

¹ οὐσία conj. Sch. (but he retracted it); συνουσία MSS. (?) Ald.

² This definition is quoted by Hesych. s.v. μίσχος.

³ ? om. ἔλιξ, which is mentioned below.

⁴ τὸ συγκείμενον σπέρμα, lit. 'the compound seed,' i.e. as many seeds as are contained in one περικάρπιον.

ENQUIRY INTO PLANTS, I. II. 1-3

they are derived—sap, fibre, veins, flesh: for these are elementary substances—unless one should prefer to call them the active principles of the elements; and they are common to all the parts of the plant. Thus the essence¹ and entire material of plants consist in these.

Again there are other as it were annual parts, which help towards the production of the fruit, as leaf, flower, stalk (that is, the part by which the leaf and the fruit are attached to the plant),² and again tendril,³ 'catkin' (in those plants that have them). And in all cases there is the seed which belongs to the fruit: by 'fruit' is meant the seed or seeds,⁴ together with the seed-vessel. Besides these there are in some cases peculiar parts, such as the gall in the oak, or the tendril in the vine.

In the case of trees we may thus distinguish the annual parts, while it is plain that in annual plants *all* the parts are annual: for the end of their being is attained when the fruit is produced. And with those plants which bear fruit annually, those which take two years (such as celery and certain others⁵) and those which have fruit on them for a longer time—with all these the stem will correspond to the plant's length of life: for plants develop a stem at whatever time they are about to bear seed, seeing that the stem exists for the sake of the seed.

Let this suffice for the definition of these parts: and now we must endeavour to say what each of the parts just mentioned is, giving a general and typical description.

The sap is obvious: some call it simply in all cases 'juice,' as does Menestor⁶ among others: others, in

⁵ *cf.* 7.1.2 and 3. ⁶ A Pythagorean philosopher of Sybaris.

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δ' ἐν μὲν τοῖς ἄλλοις ἀνωνύμως ἐν δέ τισιν ὀπὸν καὶ ἐν ἄλλοις δάκρυον. Ἰνες δὲ καὶ φλέβες καθ' αὐτὰ μὲν ἀνώνυμα τῇ δὲ ὁμοιότητι μεταλαμβάνουσι τῶν ἐν τοῖς ζώοις μορίων. ἔχει δὲ ἵσως καὶ ἄλλας διαφορὰς καὶ ταῦτα καὶ ὅλως τὸ τῶν φυτῶν γένος· πολύχονν γὰρ ὕσπερ εἰρήκαμεν. ἀλλ' ἐπεὶ διὰ τῶν γνωριμωτέρων μεταδιώκειν δεῖ τὰ ἀγνώριστα, γνωριμώτερα δὲ τὰ μείζω καὶ ἐμφανῆ τῇ αἰσθήσει, δῆλον ὅτι καθάπερ ὑφήγηται ⁴ περὶ τούτων λεκτέον· ἐπαναφορὰν γὰρ ἔξομεν τῶν ἄλλων πρὸς ταῦτα μέχρι πόσου καὶ πῶς ἔκαστα μετέχει τῆς ὁμοιότητος. εἰλημμένων δὲ τῶν μερῶν μετὰ ταῦτα ληπτέον τὰς τούτων διαφοράς· οὕτως γὰρ ἄμα καὶ ἡ οὐσία φανερὰ καὶ ἡ ὅλη τῶν γενῶν πρὸς ἄλληλα διάστασις.

'Η μὲν οὖν τῶν μεγίστων σχεδὸν εἰρηται· λέγω δ' οίον ρίζης καυλοῦ τῶν ἄλλων· αἱ γὰρ δυνάμεις καὶ ὡν χάριν ἔκαστον ὕστερον ρήθησονται. ἔξ ὡν γὰρ καὶ ταῦτα καὶ τὰ ἄλλα σύγκειται πειρατέον εἰπεῖν ἀρξαμένους ἀπὸ τῶν πρώτων.

Πρῶτα δέ ἐστι τὸ ὑγρὸν καὶ θερμόν· ἄπαν γὰρ φυτὸν ἔχει τιὰ ὑγρότητα καὶ θερμότητα σύμφυτον ὕσπερ καὶ ζῶον, ὡν ὑπολειπόντων γίνεται γῆρας καὶ φθίσις, τελείως δὲ ὑπολιπόντων θάνατος καὶ αὔανσις. ἐν μὲν οὖν τοῖς πλείστοις ἀνώ-

¹ Lit. 'muscles and veins.'

² i.e. the analogy with animals is probably imperfect, but is useful so far as it goes.

³ 1. 1. 10. ⁴ e.g. the root, as such.

⁵ e.g. the different forms which roots assume.

ENQUIRY INTO PLANTS, I. II. 3-5

the case of some plants give it no special name, while in some they call it 'juice,' and in others 'gum.' Fibre and 'veins'¹ have no special names in relation to plants, but, because of the resemblance, borrow the names of the corresponding parts of animals.² It may be however that, not only these things, but the world of plants generally, exhibits also other differences as compared with animals: for, as we have said,³ the world of plants is manifold. However, since it is by the help of the better known that we must pursue the unknown, and better known are the things which are larger and plainer to our senses, it is clear that it is right to speak of these things in the way indicated: for then in dealing with the less known things we shall be making these better known things our standard, and shall ask how far and in what manner comparison is possible in each case. And when we have taken the parts,⁴ we must next take the differences which they exhibit,⁵ for thus will their essential nature become plain, and at the same time the general differences between one kind of plant and another.

Now the nature of the most important parts has been indicated already, that is, such parts as the root, the stem, and the rest: their functions and the reasons for which each of them exists will be set forth presently. For we must endeavour to state of what these, as well as the rest, are composed, starting from their elementary constituents.

First come moisture and warmth: for every plant, like every animal, has a certain amount of moisture and warmth which essentially belong to it; and, if these fall short, age and decay, while, if they fail altogether, death and withering ensue. Now in

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υνυμος ἡ ὑγρότης, ἐν ἐνίοις δὲ ὡνομασμένη καθάπερ εἴρηται. τὸ αὐτὸ δὲ καὶ ἐπὶ τῶν ζώων ὑπάρχει· μόνη γὰρ ἡ τῶν ἐναίμων ὑγρότης ὡνόμασται, δι’ ὃ καὶ διήρηται πρὸς τοῦτο στερήσει· τὰ μὲν γὰρ ἀναιμα τὰ δ’ ἐναιμα λέγεται. ἐν τι μὲν οὖν τοῦτο τὸ μέρος καὶ τὸ τούτῳ συνηρτημένον θερμόν.

“Αλλα δ’ ἥδη ἔτερα τῶν ἐντός, ἀ καθ’ ἑαυτὰ μέν ἔστιν ἀνώνυμα, διὰ δὲ τὴν ὁμοιότητα ἀπεικάζεται τοῖς τῶν ζώων μορίοις. ἔχουσι γὰρ ὕσπερ ἵνας· ὃ ἔστι συνεχὲς καὶ σχιστὸν καὶ ἐπίμηκες, ἀπαρά-
βλαστον δὲ καὶ ἀβλαστον. ἔτι δὲ φλέβας. αὗται δὲ τὰ μὲν ἄλλα εἰσὶν ὅμοιαι τῇ Ἰνί, μείζους δὲ καὶ παχύτεραι καὶ παραβλάστας ἔχουσαι καὶ ὑγρότητα. ἔτι ξύλον καὶ σάρξ. τὰ μὲν γὰρ ἔχει σάρκα τὰ δὲ ξύλον. ἔστι δὲ τὸ μὲν ξύλον σχιστόν, ἡ δὲ σάρξ πάντη διαιρεῖται ὕσπερ γῆ καὶ δσα γῆς· μεταξὺ δὲ γίνεται ἵνος καὶ φλεβός· φανερὰ δὲ ἡ φύσις αὐτῆς ἐν ἄλλοις τε καὶ ἐν τοῖς τῶν περικαρπίων δέρμασι. φλοιὸς δὲ καὶ μήτρα κυρίως μὲν λέγεται, δεῖ δὲ αὐτὰ καὶ τῷ λόγῳ διορίσαι. φλοιὸς μὲν οὖν ἔστι τὸ ἔσχατον καὶ χωριστὸν τοῦ ὑποκειμένου σώματος. μήτρα δὲ τὸ μεταξὺ τοῦ ξύλου, τρίτον ἀπὸ τοῦ φλοιοῦ οἷον ἐν τοῖς ὄστοις μυελός. καλοῦσι δέ τινες τοῦτο

¹ πλείστοις conj. Mold.; πρώτοις Ald. H. ² 1. 1. 3.

³ ἀπαράβλαστον conj. R. Const.; ἀπαράβλητον UΜV Ald.

⁴ ἔτι δὲ conj. W.; ἔχον Ald. ⁵ Fibre.

⁶ i.e. can be split in one direction.

⁷ e.g. an unripe walnut.

ENQUIRY INTO PLANTS, I. II. 5-6

most¹ plants the moisture has no special name, but in some it has such a name, as has been said²: and this also holds good of animals: for it is only the moisture of those which have blood which has received a name; wherefore we distinguish animals by the presence or absence of blood, calling some 'animals with blood,' others 'bloodless.' Moisture then is one essential 'part,' and so is warmth, which is closely connected with it.

There are also other internal characters, which in themselves have no special name, but, because of their resemblance, have names analogous to those of the parts of animals. Thus plants have what corresponds to muscle; and this quasi-muscle is continuous, fissile, long: moreover no other growth starts from it either branching from the side³ or in continuation of it. Again⁴ plants have veins: these in other respects resemble the 'muscle,'⁵ but they are longer and thicker, and have side-growths and contain moisture. Then there are wood and flesh: for some plants have flesh, some wood. Wood is fissile,⁶ while flesh can be broken up in any direction, like earth and things made of earth: it is intermediate between fibre and veins, its nature being clearly seen especially in the outer covering⁷ of seed-vessels. Bark and core are properly so called,⁸ yet they too must be defined. Bark then is the outside, and is separable from the substance which it covers. Core is that which forms the middle of the wood, being third⁹ in order from the bark, and corresponding to the marrow in bones. Some call this part the 'heart,' others call it 'heart-wood': some

⁸ i.e. not by analogy with animals, like 'muscle,' 'veins,' 'flesh.'

⁹ Reckoning inclusively.

καρδίαν, οἱ δὲ ἐντεριώνην· ἔνιοι δὲ τὸ ἐντὸς τῆς μήτρας αὐτῆς καρδίαν, οἱ δὲ μυελόν.

7 Τὰ μὲν οὖν μόρια σχεδόν ἔστι τοσαῦτα. σύγκειται δὲ τὰ ὕστερον ἐκ τῶν προτέρων· ξύλου μὲν ἐξ ἴνδος καὶ ὑγροῦ, καὶ ἔνια σαρκός· ξύλοῦται γὰρ σκληρυνομένη, οἷον ἐν τοῖς φοίνιξι καὶ νάρθηξι καὶ εἴ τι ἄλλο ἐκξύλοῦται, ὥσπερ αἱ τῶν ράφανίδων ρίζαι· μήτρα δὲ ἐξ ὑγροῦ καὶ σαρκός· φλοιὸς δὲ ὁ μέν τις ἐκ πάντων τῶν τριῶν, οἷον ὁ τῆς δρυὸς καὶ αὐγείρου καὶ ἀπίου· ὁ δὲ τῆς ἀμπέλου ἐξ ὑγροῦ καὶ ἴνος· ὁ δὲ τοῦ φελλοῦ ἐκ σαρκὸς καὶ ὑγροῦ. πάλιν δὲ ἐκ τούτων σύνθετα τὰ μέγιστα καὶ πρώτα ρήθεντα καθαπερανεὶ μέλη, πλὴν οὐκ ἐκ τῶν αὐτῶν πάντα οὐδὲ ὡσαύτως ἀλλὰ διαφόρως.

Εἰλημμένων δὲ πάντων τῶν μορίων ὡς εἰπεῖν τὰς τούτων διαφορὰς πειρατέον ἀποδιδόναι καὶ τὰς ὅλων τῶν δένδρων καὶ φυτῶν οὐσίας.

III. Ἐπεὶ δὲ συμβαίνει σαφεστέραν εἶναι τὴν μάθησιν διαιρουμένων κατὰ εἰδῆ, καλῶς ἔχει τοῦτο ποιεῦν ἐφ' ὧν ἐνδέχεται. πρώτα δέ ἔστι καὶ μέγιστα καὶ σχεδὸν ὑφ' ὧν πάντ' ἡ τὰ πλεῖστα περιέχεται τάδε, δένδρον θάμνος φρυγανον πόα.

Δένδρον μὲν οὖν ἔστι τὸ ἀπὸ ρίζης μονοστέλεχες

¹ φελλοῦ conj. H.; φύλλον UVP₂P₃Ald.; φυλλοῦ M.

² i.e. root, stem, branch, twig: cf. 1. 1. 9.

³ σαφεστέραν conj. W.; σαφεστέρον Ald.

⁴ εἰδῆ here = γένη; cf. 6. 1. 2. n.

⁵ πάντ' ἡ conj. Sch. after G; πάντη UMVAld.

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again call only the inner part of the core itself the 'heart,' while others distinguish this as the 'marrow.'

Here then we have a fairly complete list of the 'parts,' and those last named are composed of the first 'parts'; wood is made of fibre and sap, and in some cases of flesh also; for the flesh hardens and turns to wood, for instance in palms *ferula* and in other plants in which a turning to wood takes place, as in the roots of radishes. Core is made of moisture and flesh: bark in some cases of all three constituents, as in the oak black poplar and pear; while the bark of the vine is made of sap and fibre, and that of the cork-oak¹ of flesh and sap. Moreover out of these constituents are made the most important parts,² those which I mentioned first, and which may be called 'members': however not all of them are made of the same constituents, nor in the same proportion, but the constituents are combined in various ways.

Having now, we may say, taken all the parts, we must endeavour to give the differences between them and the essential characters of trees and plants taken as wholes.

Definitions of the various classes into which plants may be divided.

III. Now since our study becomes more illuminating³ if we distinguish different kinds,⁴ it is well to follow this plan where it is possible. The first and most important classes, those which comprise all or nearly all⁵ plants, are tree, shrub, under-shrub, herb.

A tree is a thing which springs from the root with

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πολύκλαδον ὁζωτὸν οὐκ εὐαπόλυτον, οἷον ἐλάα συκῆ ἄμπελος· θάμνος δὲ τὸ ἀπὸ ῥίζης πολύκλαδον, οἷον βάτος παλίουρος. φρύγανον δὲ τὸ ἀπὸ ῥίζης πολυστέλεχες καὶ πολύκλαδον οἷον καὶ θύμβρα καὶ πήγανον. πόα δὲ τὸ ἀπὸ ῥίζης φυλλοφόρον προϊὸν ἀστέλεχες, οὐδὲν ὁ καυλὸς σπερμοφόρος, οἷον ὁ σῖτος καὶ τὰ λάχανα.

2 Δεῖ δὲ τοὺς ὅρους οὕτως ἀποδέχεσθαι καὶ λαμβάνειν ως τύπῳ καὶ ἐπὶ τὸ πᾶν λεγομένους· ἔνια γὰρ ἵσως ἐπαλλάττειν δόξειε, τὰ δὲ καὶ παρὰ τὴν ἀγωγὴν ἀλλοιότερα γίνεσθαι καὶ ἐκβαίνειν τῆς φύσεως, οἷον μαλάχη τε εἰς ὑψος ἀναγομένη καὶ ἀποδευδρουμένη· συμβαίνει γὰρ τοῦτο καὶ οὐκ ἐν πολλῷ χρόνῳ ἀλλ’ ἐν ἑξ ἢ ἑπτὰ μησὶν, ὥστε μῆκος καὶ πάχος δορατιαῖν γίνεσθαι, δι’ δὲ καὶ βακτηρίαις αὐταῖς χρώνται, πλείονος δὲ χρόνου γινομένου κατὰ λόγον ἡ ἀπόδοσις· ὁμοίως δὲ καὶ ἐπὶ τῶν τεύτλων· καὶ γὰρ ταῦτα λαμβάνει μέγεθος· ἔτι δὲ μᾶλλον ἄγνοι καὶ ὁ παλίουρος καὶ ὁ κιττός, ὥσθ’ ὁμολογουμένως ταῦτα γίνεται

3 δένδρα· καὶ τοι θαμνώδη γέ ἔστιν. ὁ δὲ μύρρινος μὴ ἀνακαθαιρόμενος ἐκθαμνοῦται καὶ ἡ ἡρακλεωτικὴ καρύα. δοκεῖ δὲ αὕτη γε καὶ τὸν καρπὸν βελτίω καὶ πλείω φέρειν ἐὰν ῥάβδους τις ἐὰ-

¹ θάμνος . . . πήγανον. W.'s text transposes, without alteration, the definitions of θάμνος and φρύγανον as given in U. φρύγανον δὲ τὸ ἀπὸ ῥίζης καὶ πολυστέλεχες καὶ πολύκλαδον οἷον βάτος παλίουρος, Ald. So also M, but with a lacuna marked before φρύγανον and a note that the definition of θάμνος is wanting. φρύγανον δὲ τὸ ἀπὸ ῥίζης καὶ πολυστέλεχες καὶ πολύκλαδον οἷον καὶ γάμβρη καὶ πήγανον. θάμνος δὲ ἀπὸ ῥίζης πολύκλαδον οἷον βάτος παλίουρος U. So also very nearly P₁P₂. G gives to θάμνος (*frutex*) the definition assigned in U to φρύγανον (*syfrutex*) and the other definition is wanting.

a single stem, having knots and several branches, and it cannot easily be uprooted; for instance, olive fig vine. ¹A shrub is a thing which rises from the root with many branches; for instance, bramble Christ's thorn. An under-shrub is a thing which rises from the root with many stems as well as many branches; for instance, savory ² rue. A herb is a thing which comes up from the root with its leaves and has no main stem, and the seed is borne on the stem; for instance, corn and pot-herbs.

These definitions however must be taken and accepted as applying generally and on the whole. For in the case of some plants it might seem that our definitions overlap; and some under cultivation appear to become different and depart from their essential nature, for instance, mallow ³ when it grows tall and becomes tree-like. For this comes to pass in no long time, not more than six or seven months, so that in length and thickness the plant becomes as great as a spear, and men accordingly use it as a walking-stick, and after a longer period the result of cultivation is proportionately greater. So too is it with the beets; they also increase in stature under cultivation, and so still more do chaste-tree Christ's thorn ivy, so that, as is generally admitted, these become trees, and yet they belong to the class of shrubs. On the other hand the myrtle, unless it is pruned, turns into a shrub, and so does filbert ⁴: indeed this last appears to bear better and more abundant fruit, if one leaves

Note that W.'s transposition gives καὶ . . . καὶ the proper force; § 4 shews that the *typical φρύγανος* in T.'s view was πολυστέλεχες.

² θέματα conj. W.; γάμβη MSS. But the first καὶ being meaningless, W. also suggests σισύμβριον for καὶ γάμβη.

³ cf. Plin. 19. 62. ⁴ cf. 3. 15. 1.

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πλείους ώς τῆς φύσεως θαμνώδους οὔσης. οὐ μονοστέλεχες δ' ἀν δόξειεν οὐδὲ ή μηλέα οὐδὲ ή ροιὰ οὐδὲ ή ἄπιος εἶναι, οὐδὲ ὅλως ὅσα παραβλαστητικὰ ἀπὸ τῶν ῥιζῶν ἀλλὰ τῇ ἀγωγῇ τοιαῦτα παραιρουμένων τῶν ἄλλων. ἔνια δὲ καὶ ἐώσι πολυστελέχη διὰ λεπτότητα, καθάπερ ῥόαν μηλέαν· ἐώσι δὲ καὶ τὰς ἐλάσις κοπάδας καὶ τὰς συκᾶς.

4 Τάχα δ' ἂν τις φαίη καὶ ὅλως μεγέθει καὶ μικρότητι διαιρετέον εἶναι, τὰ δὲ ἴσχυῖ καὶ ἀσθενείᾳ καὶ πολυχρονιότητι καὶ ὀλιγοχρονιότητι. τῶν τε γὰρ φρυγανωδῶν καὶ λαχανωδῶν ἔνια μονοστελέχη καὶ οἰον δένδρου φύσιν ἔχοντα γίνεται, καθάπερ ῥάφανος πήγανον, δθεν καὶ καλούσι τινες τὰ τοιαῦτα δευδρολάχανα, τά τε λαχανώδη πάντα ή τὰ πλεῖστα ὅταν ἐγκαταμείνη λαμβάνει τινὰς ὥσπερ ἀκρεμόνας καὶ γίνεται τὸ ὅλον ἐν σχήματι δευδρώδει πλὴν ὀλιγοχρονιώτερα.

5 Διὰ δὴ ταῦτα ὥσπερ λέγομεν οὐκ ἀκριβολογητέον τῷ ὅρῳ ἀλλὰ τῷ τύπῳ ληπτέον τοὺς ἀφορισμούς· ἐπεὶ καὶ τὰς διαιρέσεις ὄμοιώς, οἰον ἡμέρων ἀγρίων, καρποφόρων ἀκάρπων, ἀνθοφόρων ἀναινθῶν, ἀειφύλλων φυλλοβόλων. τὰ μὲν γὰρ ἄγρια καὶ ἡμερά παρὰ τὴν ἀγωγὴν εἶναι δοκεῖ· πᾶν γὰρ καὶ ἄγριον καὶ ἡμερόν φησιν "Ιππων γίνεσθαι τυγχάνον" ή μὴ τυγχάνον θεραπείας.

¹ i.e. so that the tree comes to look like a shrub from the growth of fresh shoots after cutting. cf. 2. 6. 12; 2. 7. 2.

² ῥάφανος conj. Bod. from G; ῥαφανίς Ald.

³ cf. 3. 2. 2. The Ionian philosopher. See Zeller, *Pre-Socratic Philosophy* (Eng. trans.), 1. 281 f.

⁴ καὶ add. W.; so G.

⁵ ή conj. Sch.; καὶ U Ald. Casm. Bas. H.

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a good many of its branches untouched, since it is by nature like a shrub. Again neither the apple nor the pomegranate nor the pear would seem to be a tree of a single stem, nor indeed any of the trees which have side stems from the roots, but they acquire the character of a tree when the other stems are removed. However some trees men even leave with their numerous stems because of their slenderness, for instance, the pomegranate and the apple, and they leave the stems of the olive and the fig cut short.¹

Exact classification impracticable: other possible bases of classification.

Indeed it might be suggested that we should classify in some cases simply by size, and in some cases by comparative robustness or length of life. For of under-shrubs and those of the pot-herb class some have only one stem and come as it were to have the character of a tree, such as cabbage² and rue: wherefore some call these 'tree-herbs'; and in fact all or most of the pot-herb class, when they have been long in the ground, acquire a sort of branches, and the whole plant comes to have a tree-like shape, though it is shorter lived than a tree.

For these reasons then, as we are saying, one must not make a too precise definition; we should make our definitions typical. For we must make our distinctions too on the same principle, as those between wild and cultivated plants, fruit-bearing and fruitless, flowering and flowerless, evergreen and deciduous. Thus the distinction between wild and cultivated seems to be due simply to cultivation, since, as Hippo³ remarks, any plant may be either⁴ wild or cultivated according as it receives or⁵ does not receive attention.

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ἄκαρπα δὲ καὶ κάρπιμα καὶ ἀνθεφόρα καὶ ἀνανθῆ παρὰ τοὺς τόπους καὶ τὸν ἀέρα τὸν περιέχοντα· τὸν αὐτὸν δὲ τρόπον καὶ φυλλοβόλα καὶ ἀειφυλλα. περὶ γάρ Ἐλεφαντίνην οὐδὲ τὰς ἀμπέλους οὐδὲ τὰς συκᾶς φασι φυλλοβολεῖν.

⁶ Ἐλλα' ὅμως τοιαῦτα διαιρετέον¹ ἔχει γάρ τι τῆς φύσεως κοινὸν ὁμοίως ἐν δένδροις καὶ θάμνοις καὶ τοῖς φρυγανικοῖς καὶ ποιώδεσιν² ὑπὲρ ὅν καὶ τὰς αἰτίας ὅταν τις λέγῃ περὶ πάντων κοινῆς δῆλον ὅτι λεκτέον οὐχ ὄριζοντα καθ' ἔκαστον³ εὐλογον δὲ καὶ ταύτας κοινὰς εἶναι πάντων. ἅμα δὲ καὶ φαίνεται⁴ τινα ἔχειν φυσικὴν διαφορὰν εὐθὺς ἐπὶ τῶν ἀγρίων καὶ τῶν ἡμέρων, εἴπερ ἔνια μὴ δύναται ζῆν ὥσπερ τὰ γεωργούμενα μηδ' ὅλως δέχεται θεραπείαν ἀλλὰ χείρω γίνεται, καθάπερ ἐλάτη πεύκη κήλαστρον καὶ ἀπλῶς ὅσα ψυχροὺς τόπους φιλεῖ καὶ χιονώδεις, ὡσαύτως δὲ καὶ τῶν φρυγανικῶν καὶ ποιωδῶν, οἷον κάππαρις καὶ θέρμος. ἡμερον δὲ καὶ ἄγριον δίκαιον καλεῖν ἀναφέροντα πρὸς τε ταῦτα καὶ ὅλως πρὸς τὸ ἡμερώτατον⁵ [οὐ δ' ἄνθρωπος ή μόνον ή μάλιστα ἡμερον.]

IV. Φανεραὶ δὲ καὶ κατ' αὐτὰς τὰς μορφὰς αἱ διαφοραὶ τῶν ὅλων τε καὶ μορίων, οἷον λέγω

¹ ἀνθεφόρα καὶ ἀνανθῆ conj. Sch. from G; καρπόφορα ἀνθη P₂Ald. ² cf. 1. 9. 5; Plin. 16. 81.

³ τοιαῦτα conj. W.; διαιρετέον conj. Sch.; τοῖς αὐτοῖς αἰρετέον Ald. The sense seems to be: Though these 'secondary' distinctions are not entirely satisfactory, yet (if we look to the *causes* of different characters), they are indispensable, since they are due to causes which affect all the four classes of our 'primary' distinction.

⁴ i.e. we must take the *extreme* cases.

⁵ i.e. plants which entirely refuse cultivation.

ENQUIRY INTO PLANTS, I. III. 5-IV. 1

Again the distinctions between fruitless and fruit-bearing,¹ flowering and flowerless, seem to be due to position and the climate of the district. And so too with the distinction between deciduous and evergreen. ² Thus they say that in the district of Elephantine neither vines nor figs lose their leaves.

Nevertheless we are bound to use such distinctions.³ For there is a certain common character alike in trees, shrubs, under-shrubs, and herbs. Wherefore, when one mentions the causes also, one must take account of all alike, not giving separate definitions for each class, it being reasonable to suppose that the causes too are common to all. And in fact there seems to be some natural difference from the first in the case of wild and cultivated, seeing that some plants cannot live under the conditions of those grown in cultivated ground, and do not submit to cultivation at all, but deteriorate under it; for instance, silver-fir fir holly, and in general those which affect cold snowy country; and the same is also true of some of the under-shrubs and herbs, such as caper and lupin. Now in using the terms 'cultivated' and 'wild'⁴ we must make these⁵ on the one hand our standard, and on the other that which is in the truest sense⁶ 'cultivated.'⁷ Now Man, if he is not the only thing to which this name is strictly appropriate, is at least that to which it most applies.

Differences as to appearance and habitat.

IV. Again the differences, both between the plants as wholes and between their parts, may be seen in

⁶ *δλως πρὸς τὸ. ? πρὸς τὸ δλως* conj. St.

⁷ δ δ' *κυθρωπος . . . ήμερον.* I have bracketed this clause, which seems to be an irrelevant gloss.

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μέγεθος καὶ μικρότης, σκληρότης μαλακότης, λειότης τραχύτης, φλοιοῦ φύλλων τῶν ἄλλων, ἀπλῶς εύμορφία καὶ δυσμορφία τις, ἔτι δὲ καὶ καλλικαρπία καὶ κακοκαρπία. πλείω μὲν γὰρ δοκεῖ τὰ ἄγρια φέρειν, ὥσπερ ἀχράς κότινος, καλλίω δὲ τὰ ἡμέρα καὶ τοὺς χυλοὺς δὲ αὐτοὺς γλυκυτέρους καὶ ἡδίους καὶ τὸ δλον ὡς εἰπένι εὐκράτους μᾶλλον.

2 Αὗταί τε δὴ φυσικαί τινες ὥσπερ εἴρηται διαφοραί, καὶ ἔτι δὴ μᾶλλον τῶν ἀκάρπων καὶ καρποφόρων καὶ φυλλοβόλων καὶ ἀειφύλλων καὶ ὅσα ἄλλα τοιαῦτα. πάντων δὲ ληπτέον ἀεὶ καὶ τὰς κατὰ τοὺς τόπους· οὐ γὰρ οὐδὲ οἰόν τε ἵσως ἄλλως. αἱ δὲ τοιαῦται δόξαιεν ἀν γενικόν τινα ποιεῖν χωρισμόν, οίου ἐνύδρων καὶ χερσαίων, ὥσπερ ἐπὶ τῶν ζώων. ἔστι γὰρ ἔνια τῶν φυτῶν ἂν οὐ δύναται μὴ ἐν ὑγρῷ ζῆν· διήρηται δὲ ἄλλο κατ' ἄλλο γένος τῶν ὑγρῶν, ὥστε τὰ μὲν ἐν τέλμασι τὰ δὲ ἐν λίμναις τὰ δὲ ἐν ποταμοῖς τὰ δὲ καὶ ἐν αὐτῇ τῇ θαλάττῃ φύεσθαι, τὰ μὲν ἐλάττω καὶ ἐν τῇ παρ' ἡμῖν τὰ δὲ μείζω περὶ τὴν ἐρυθράν. ἔνια δὲ ὥσπερεὶ κάθυγρα καὶ ἔλεια, καθάπερ ἵτεα καὶ πλάτανος, τὰ δὲ οὐκ ἐν ὕδατι δυνάμενα ζῆν οὐδὲ δλως ἄλλὰ διώκοντα τοὺς ξηροὺς τόπους· τῶν δὲ ἐλαττόνων ἔστιν ἀ καὶ τοὺς αἰγιαλούς.

¹ κατ' αὐτὰς τὰς conj. Sch. ; ^{κα} καὶ τὰ τ' αὐτὰς τὰς U ; κατὰ ταύτας τὰς MVAld.

² πάντων . . . τόπους, text perhaps defective.

³ i.e. as to locality. ⁴ cf. 4. 7. 1.

ENQUIRY INTO PLANTS, I. IV. 1-2

the appearance itself¹ of the plant. I mean differences such as those in size, hardness, smoothness or their opposites, as seen in bark, leaves, and the other parts; also, in general, differences as to comeliness or its opposite and as to the production of good or of inferior fruit. For the wild kinds appear to bear more fruit, for instance, the wild pear and wild olive, but the cultivated plants better fruit, having even flavours which are sweeter and pleasanter and in general better blended, if one may so say.

These then as has been said, are differences of natural character, as it were, and still more so are those between fruitless and fruitful, deciduous and evergreen plants, and the like. But with all the differences in all these cases we must take into account the locality,² and indeed it is hardly possible to do otherwise. Such ³differences would seem to give us a kind of division into classes, for instance, between that of aquatic plants and that of plants of the dry land, corresponding to the division which we make in the case of animals. For there are some plants which cannot live except in wet; and again these are distinguished from one another by their fondness for different kinds of wetness; so that some grow in marshes, others in lakes, others in rivers, others even in the sea, smaller ones in our own sea, larger ones in the Red Sea.⁴ Some again, one may say, are lovers of very wet places,⁵ or plants of the marshes, such as the willow and the plane. Others again cannot live at all⁶ in water, but seek out dry places; and of the smaller sorts there are some that prefer the shore.

⁵ i.e. though not actually living in water.

⁶ οὐδὲν δλως conj. W.; ἐν τῷτοις Ald.H. *Minime* G.

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3 Οὐ μὴν ἀλλὰ καὶ τούτων εἴ τις ἀκριβολογεῖσθαι θέλοι, τὰ μὲν ἀν εῦροι κοινὰ καὶ ὥσπερ ἀμφίβια, καθάπερ μυρίκην ἵτεαν κλήθραν, τὰ δὲ καὶ τῶν ὁμολογουμένων χερσαίων πεφυκότα ποτὲ ἐν τῇ θαλάττῃ βιοῦν, φοίνικα σκίλλαν ἀνθέρικον. ἀλλὰ τὰ τοιαῦτα καὶ ὅλως τὸ οὕτω σκοπεῖν οὐκ οἰκείως ἐστὶ σκοπεῖν· οὐδὲ γὰρ οὐδὲ ἡ φύσις οὕτως οὐδὲ ἐν τοῖς τοιούτοις ἔχει τὸ ἀναγκαῖον. τὰς μὲν οὖν διαιρέσεις καὶ ὅλως τὴν ἱστορίαν τῶν φυτῶν οὕτω ληπτέον. [ἄπαντα δ' οὖν καὶ ταῦτα καὶ τὰ ἄλλα διοίσει καθάπερ εἴρηται ταῖς τε τῶν ὅλων μορφαῖς καὶ ταῖς τῶν μορίων διαφοραῖς, ἡ τῷ ἔχειν τὰ δὲ μὴ ἔχειν, ἡ τῷ πλείω τὰ δὲ ἐλάττω, ἡ τῷ ἀνομοίως ἡ ὅσοι τρόποι διήρηνται

4 πρότερον. οἰκεῖον δὲ ἵστως καὶ τοὺς τόπους συμπαραλαμβάνειν ἐν οἷς ἔκαστα πέφυκεν ἡ μὴ πέφυκε γίνεσθαι. μεγάλη γὰρ καὶ αὕτη διαφορὰ καὶ οὐχ ἥκιστα οἰκεία τῶν φυτῶν διὰ τὸ συνηρτῆσθαι τῇ γῇ καὶ μὴ ἀπολελύσθαι καθάπερ τὰ ζῶα.]

V. Πειρατέον δ' εἰπεῖν τὰς κατὰ μέρος διαφορὰς ὡς ἀν καθόλου λέγοντας πρῶτον καὶ κοινῶς,

¹ θέλοι conj. Sch.; θέλει Ald. H.

² εῦροι conj. Sch.; εῦρη Ald.; εῦρη H.

³ Presumably as being sometimes found on the shore below high-water mark.

⁴ ἄπαντα . . . ζῶα. This passage seems not to belong here (W.).

⁵ τρόποι conj. Sch.; τόποι UΜV Ald.

However, if one should wish¹ to be precise, one would find² that even of these some are impartial and as it were amphibious, such as tamarisk willow alder, and that others even of those which are admitted to be plants of the dry land sometimes live in the sea,³ as palm squill asphodel. But to consider all these exceptions and, in general, to consider in such a manner is not the right way to proceed. For in such matters too nature certainly does not thus go by any hard and fast law. Our distinctions therefore and the study of plants in general must be understood accordingly.⁴ To return—these plants as well as all others will be found to differ, as has been said, both in the shape of the whole and in the differences between the parts, either as to having or not having certain parts, or as to having a greater or less number of parts, or as to having them differently arranged, or because of other differences⁵ such as we have already mentioned. And it is perhaps also proper to take into account the situation in which each plant naturally grows or does not grow. For this is an important distinction, and specially characteristic of plants, because they are united to the ground and not free from it like animals.

Characteristic differences in the parts of plants, whether general, special, or seen in qualities and properties.

V. Next we must try to give the differences as to particular parts, in the first instance speaking broadly of those of a general character,⁶ and then

⁶ i.e. those which divide plants into large classes (e.g. evergreen and deciduous).

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είτα καθ' ἔκαστον, ὕστερον ἐπὶ πλεῖον ὥσπερ
ἀναθεωροῦντας.

Ἐστι δὲ τὰ μὲν ὄρθοφυῆ καὶ μακροστελέχη
καθάπερ ἐλάτη πεύκη κυπάριστος, τὰ δὲ σκο-
λιώτερα καὶ βραχυστελέχη οἷον ἵτεα συκῆ ροιά,
καὶ κατὰ πάχος δὲ καὶ λεπτότητα ὄμοιώς.
καὶ πάλιν τὰ μὲν μονοστελέχη τὰ δὲ πολυ-
στελέχη¹ τοῦτο δὲ ταῦτὸ τρόπον τινὰ καὶ τῷ
παραβλαστητικὰ ἡ ἀπαράβλαστα εἶναι καὶ
πολυκλαδῆ καὶ ὀλιγόκλαδα καθάπερ ὁ φοῖνιξ,
καὶ ἐν αὐτοῖς τούτοις ἔτι κατὰ ἴσχὺν ἡ πάχος ἡ
2 τὰς τοιαύτας διαφοράς. πάλιν τὰ μὲν λεπτό-
φλοια, καθάπερ δάφνη φίλυρα, τὰ δὲ παχύφλοια,
καθάπερ δρῦς. ἔτι τὰ μὲν λειόφλοια, καθάπερ
μηλέα συκῆ, τὰ δὲ τραχύφλοια, καθάπερ ἀγρία
δρῦς φελλὸς φοῖνιξ. πάντα δὲ νέα μὲν ὄντα
λειοφλοιότερα, ἀπογηράσκοντα δὲ τραχυφλοιό-
τερα, ἔνια δὲ καὶ ρηξίφλοια, καθάπερ ἀμπέλος, τὰ
δὲ καὶ ὡς περιπίπτειν, οἷον ἀνδράχλη μηλέα
κόμαρος. ἔστι δὲ καὶ τῶν μὲν σαρκώδης ὁ φλοιός,
οἷον φελλοῦ δρυὸς αἰγείρου· τῶν δὲ ἴνωδης καὶ
ἄσαρκος ὄμοιώς δένδρων καὶ θάμνων καὶ ἐπετείων,
οἷον ἀμπέλου καλάμου πυροῦ. καὶ τῶν μὲν
πολύλοπος, οἷον φιλύρας ἐλάτης ἀμπέλου λινο-
σπάρτου κρομύων, τῶν δὲ μονόλοπος, οἷον συκῆς

¹ i.e. taking account of differences in qualities, etc. See § 4, but the order in which the three kinds of 'differences' are discussed is not that which is here given; the second is taken first and resumed at 6. 1, the third begins at 5. 4, the first at 14. 4.

² ταῦτα conj. Sch.; αὐτὰ UMVP Ald.

³ τραχυφλοιότερα conj. H. from G.; παχυφ. UMAld. cf. Plin. 16. 126.

ENQUIRY INTO PLANTS, I. v. 1-2

of special differences between individual kinds ; and after that we must take a wider range, making as it were a fresh survey.¹

Some plants grow straight up and have tall stems, as silver-fir fir cypress ; some are by comparison crooked and have short stems, as willow fig pomegranate ; and there are like differences as to degree of thickness. Again some have a single stem, others many stems ; and this difference corresponds² more or less to that between those which have side-growths and those which have none, or that between those which have many branches and those which have few, such as the date-palm. And in these very instances we have also differences in strength thickness and the like. Again some have thin bark, such as bay and lime ; others have a thick bark, such as the oak. And again some have smooth bark, as apple and fig ; others rough bark, as 'wild oak' (Valonia oak) cork-oak and date-palm. However all plants when young have smoother bark, which gets rougher³ as they get older ; and some have cracked bark,⁴ as the vine ; and in some cases it readily drops off, as in andrachne apple⁵ and arbutus. And again of some the bark is fleshy, as in cork-oak oak poplar ; while in others it is fibrous and not fleshy ; and this applies alike to trees shrubs and annual plants, for instance to vines reeds and wheat. Again in some the bark has more than one layer, as in lime silver-fir vine Spanish broom⁶ onions⁷ ; while in some it consists of only

¹ *ρηξιφλοια* conj. St. ; *ριζιφοια* (?) U ; *ριζιφλοια* P. ; *ριζόφλοια* P₂Ald. cf. 4. 15. 2, Plin. l.c.

² *μηλέα* conj. H. Steph., etc. ; *μηλεία* UMPAld. ; *μηλεια* P₂V. cf. Plin. l.c.

³ G appears to have read *λίνου*, *σπάρτου*. ⁷ cf. 5. 1, 6.

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καλάμου αἴρας. κατὰ μὲν δὴ τοὺς φλοιοὺς ἐν τούτοις αἱ διαφοραί.

3 Τῶν δὲ ξύλων αὐτῶν καὶ ὅλως τῶν καυλῶν οἱ μέν εἰσι σαρκώδεις, οἷον δρυὸς συκῆς, καὶ τῶν ἐλαττόνων ῥάμνου τεύτλου κωνείου¹ οἱ δὲ ἄσαρκοι, καθάπερ κέδρου λωτοῦ κυπαρίττου. καὶ οἱ μὲν ἴνωδεις· τὰ γὰρ τῆς ἐλάτης καὶ τοῦ φοίνικος ξύλα τοιαῦτα· τὰ δὲ ἄινα, καθάπερ τῆς συκῆς. ὡσαύτως δὲ καὶ τὰ μὲν φλεβώδη τὰ δὲ ἄφλεβα. περὶ δὲ τὰ φρυγανικὰ καὶ θαμνώδη καὶ ὅλως τὰ ὑλήματα καὶ ἄλλας τις ἀν λάβοι διαφοράς· ὁ μὲν γὰρ κάλαμος γονατώδεις, ὁ δὲ βάτος καὶ ὁ παλίουρος ἀκανθώδη. ἡ δὲ τύφη καὶ ἔνια τῶν ἐλείων ἡ λιμναίων ὄμοιώς ἀδιάφρακτα καὶ ὄμαλη, καθάπερ σχοῖνος. ὁ δὲ τοῦ κυπείρου καὶ βουτόμου καυλὸς ὄμαλότητά τινα ἔχει παρὰ τούτους· ἔτι δὲ μᾶλλον ἵσως ὁ τοῦ μύκητος.

4 Αὗται μὲν δὴ δόξαιεν ἀν ἔξ ὀν ἡ σύνθεσις. αἱ δὲ κατὰ τὰ πάθη καὶ τὰς δυνάμεις οἷον σκληρότης μαλακότης γλισχρότης κραυρότης <πυκνότης> μανότης κουφότης βαρύτης καὶ ὅσα ἄλλα τοιαῦτα· ἡ μὲν γὰρ ἵτέα καὶ χλωρὸν εὐσὺν κοῦφον, ὥσπερ ὁ φελλός, ἡ δὲ πύξος καὶ ἡ ἔβενος οὐδὲ αὐανθέντα. καὶ τὰ μὲν σχίζεται, καθάπερ τὰ τῆς

¹ ῥάμνου conj. W.; θάμνου P₂; βαλάνου Ald. H.

² κωνείου conj. Sch.; κωνίου Ald. U (corrected to κωνείου). cf. 7. 6. 4.

³ δὲ ἄινα conj. Sch from G.; δὲ βίνα U; δὲ μανά Ald.; δὲ . . . να M.

⁴ ὑλήματα conj. Sch. (a general term including shrubs, under-shrubs, etc. cf. 1. 6. 7; 1. 10. 6); κλήματα, Ald.

ENQUIRY INTO PLANTS, I. v. 2-4

one coat, as in fig reed darnel. Such are the respects in which bark differs.

Next of the woods themselves and of stems generally some are fleshy, as in oak and fig, and, among lesser plants, in buckthorn¹ beet hemlock²; while some are not fleshy, for instance, prickly cedar nettle-tree cypress. Again some are fibrous, for of this character is the wood of the silver-fir and the date-palm; while some are not fibrous,³ as in the fig. In like manner some are full of 'veins,' others veinless. Further in shrubby plants and under-shrubs and in woody plants⁴ in general one might find other differences: thus the reed is jointed, while the bramble and Christ's thorn have thorns on the wood. Bulrush and some of the marsh or pond plants are in like manner⁵ without joints and smooth, like the rush; and the stem of galingale and sedge has a certain smoothness beyond those just mentioned; and still more perhaps has that of the mushroom.

Differences as to qualities and properties.

These then would seem to be the differences in the parts which make up the plant. Those which belong to the qualities⁶ and properties are such as hardness or softness, toughness or brittleness, closeness or openness of texture, lightness or heaviness, and the like. For willow-wood is light from the first, even when it is green, and so is that of the cork-oak; but box and ebony are not light even when dried. Some woods again can be split,⁷ such

⁵ δμολως, sense doubtful; δμωνθμων conj. W.

⁶ πάθη, cf. I. 1. 1 n.

⁷ σχιζεται conj. W.; σχισθέντα UMVAld.; σχιστό H.; fissiles G.

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ἐλάτης, τὰ δὲ εὔθραυστα μᾶλλον, οἷον τὰ τῆς ἐλάας. καὶ τὰ μὲν ἄοξα, οἷον τὰ τῆς ἀκτῆς, τὰ δὲ ὀξώδη, οἷον τὰ τῆς πεύκης καὶ ἐλάτης.

5 Δεῖ δὲ καὶ τὰς τοιαύτας ὑπολαμβάνειν τῆς φύσεως. εὔσχιστον μὲν γάρ ἡ ἐλάτη τῷ εὐθυπορεῖν, εὔθραυστον δὲ ἡ ἐλάα διὰ τὸ σκολιὸν καὶ σκληρόν. εὔκαμπτον δὲ ἡ φίλυρα καὶ ὅσα ἄλλα διὰ τὸ γλίσχραν ἔχειν τὴν ὑγρότητα. Βαρὺ δὲ ἡ μὲν πύξος καὶ ἡ ἔβενος ὅτι πυκνά, ἡ δὲ δρῦς ὅτι γεώδεις. ὡσαύτως δὲ καὶ τὰ ἄλλα πάντα πρὸς τὴν φύσιν πως ἀνάγεται.

VI. Διαφέρουσι δὲ καὶ ταῖς μήτραις πρῶτον μὲν εἰ ἔνια ἔχει ἡ μὴ ἔχει, καθάπερ τινές φασιν ἄλλα τε καὶ τὴν ἀκτήν· ἔπειτα καὶ ἐν αὐτοῖς τοῖς ἔχουσιν τῶν μὲν γάρ ἔστι σαρκώδης τῶν δὲ ξυλώδης τῶν δὲ ὑμενώδης. καὶ σαρκώδης μὲν οἷον ἀμπέλου συκῆς μηλέας ροιᾶς ἀκτῆς νάρθηκος. ξυλώδης δὲ πίτυος ἐλάτης πεύκης, καὶ μάλιστα αὕτη διὰ τὸ ἔνδαδος εἶναι. τούτων δὲ ἔτι σκληρότεραι καὶ πυκνότεραι κρανείας πρίνου δρυὸς κυτίσου συκαμίνου ἔβένου λωτοῦ.

2 Διαφέρουσι δὲ αὐτὰλ καὶ τοῖς χρώμασι· μέλαιναι γὰρ τῆς ἔβένου καὶ τῆς δρυός, ἦν καλοῦσι μελάνδρυον. ἄπασαι δὲ σκληρότεραι καὶ κραυρό-

¹ i.e. break across the grain. *εὔθραυστα* mP; *ἄθραυστα* UP Ald.; *fragilis* G. cf. 5. 5, Plin. 16. 186.

² *ἄοξα* conj. Palm. from G; *λοξά* UP Ald.

³ i.e. across the grain. ⁴ cf. 5. 6. 2. ⁵ cf. 5. 1. 4.

⁶ T. appears not to agree as to elder: see below.

as that of the silver-fir, while others are rather breakable,¹ such as the wood of the olive. Again some are without knots,² as the stems of elder, others have knots, as those of fir and silver-fir.

Now such differences also must be ascribed to the essential character of the plant: for the reason why the wood of silver-fir is easily split is that the grain is straight, while the reason why olive-wood is easily broken³ is that it is crooked and hard. Lime-wood and some other woods on the other hand are easily bent because their sap is viscid.⁴ Boxwood and ebony are heavy because the grain is close, and oak because it contains mineral matter.⁵ In like manner the other peculiarities too can in some way be referred to the essential character.

Further ‘special’ differences.

VI. Again there are differences in the ‘core’: in the first place according as plants have any or have none, as some say⁶ is the case with elder among other things; and in the second place there are differences between those which have it, since in different plants it is respectively fleshy, woody, or membranous; fleshy, as in vine fig apple pomegranate elder ferula; woody, as in Aleppo pine silver-fir fir; in the last-named⁷ especially so, because it is resinous. Harder again and closer than these is the core of dog-wood kermes-oak oak laburnum mulberry ebony nettle-tree.

The cores in themselves also differ in colour; for that of ebony and oak is black, and in fact in the oak it is called ‘oak-black’; and in all these the core is harder and more brittle than the ordinary

⁷ αὐτη conj. Sch.; αὐτὴ UAld.; αὐτῆ MV; αὐτῆς P₂.

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τεραι τῶν ξύλων· δι’ ὁ καὶ οὐχ ὑπομένουσι καμπήν. μανότεραι δὲ αἱ μὲν αἱ δὲ οὖ. ὑμενώδεις δὲ ἐν μὲν τοῖς δένδροις οὐκ εἰσὶν ἡ σπάνιοι, ἐν δὲ τοῖς θαμνώδεσι καὶ δλως τοῖς ὑλήμασιν οἷον καλάμῳ τε καὶ νάρθηκι καὶ τοῖς τοιούτοις εἰδίν. ἔχει δὲ τὴν μήτραν τὰ μὲν μεγάλην καὶ φανεράν, ὡς πρῶτος δρῦς καὶ τάλλα προειρημένα, τὰ δὲ ἀφανεστέραν, οἷον ἐλάα πύξος· οὐ γὰρ ἔστιν ἀφωρισμένην οὕτω λαβεῖν, ἀλλὰ καὶ φασί τινες οὐ κατὰ τὸ μέσον ἀλλὰ κατὰ τὸ πᾶν ἔχειν· ὥστε μὴ εἶναι τόπον ὡρισμένον· δι’ ὁ καὶ ἔνια οὐδ’ ἀν δόξειεν δλως ἔχειν· ἐπεὶ καὶ τοῦ φοίνικος οὐδεμία φαίνεται διαφορὰ κατ’ οὐδέν.

3 Διαφέρουσι δὲ καὶ ταῖς ρίζαις. τὰ μὲν γὰρ πολύρριζα καὶ μακρόρριζα, καθάπερ συκῆ δρῦς πλάτανος· ἐὰν γὰρ ἔχωσι τόπον, ἐφ’ οσονοῦν προέρχονται. τὰ δὲ ὀλιγόρριζα, καθάπερ ροιὰ μηλέα· τὰ δὲ μονόρριζα, καθάπερ ἐλάτη πεύκη· μονόρριζα δὲ οὕτως, ὅτι μίαν μεγάλην τὴν εἰς βάθος ἔχει μικρὰς δὲ ἀπὸ ταύτης πλείους. ἔχουσι δὲ καὶ τῶν μὴ μονορρίζων ἔνια τὴν ἐκ τοῦ μέσου μεγίστην καὶ κατὰ βάθους, ὥσπερ ἀμυγδαλῆ· ἐλάα δὲ μικρὰν ταύτην τὰς δὲ ἄλλας μείζους καὶ ὡς κεκαρκινωμένας. ἔτι δὲ τῶν μὲν παχεῖαι μᾶλλον τῶν δὲ ἀνωμαλεῖς, καθάπερ δάφνης ἐλάας.

4 τῶν δὲ πᾶσαι λεπταί, καθάπερ ἀμπέλου. διαφέρουσι δὲ καὶ λειότητι καὶ τραχύτητι καὶ πυκνότητι. πάντων γὰρ αἱ ρίζαι μανότεραι τῶν ἄνω,

¹ μανότεραι . . . οὐ: text can hardly be sound, but sense is clear. ² i.e. homogeneous. ³ Plin. 16. 127.

⁴ 3. 6. 4 seems to give a different account.

⁵ cf. C.P. 3. 23. 5, and καρκινώδης C.P. 1. 12. 3; 3. 21. 5.

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wood ; and for this reason the core of these trees can not be bent. Again the core differs in closeness of texture.¹ A membranous core is not common in trees, if indeed it is found at all ; but it is found in shrubby plants and woody plants generally, as in reed ferula and the like. Again in some the core is large and conspicuous, as in kermes-oak oak and the other trees mentioned above ; while in others it is less conspicuous, as in olive and box. For in these trees one cannot find it isolated, but, as some say, it is not found in the middle of the stem, being diffused throughout, so that it has no separate place ; and for this reason some trees might be thought to have no core at all ; in fact in the date-palm the wood is alike throughout.²

Differences in root.

³ Again plants differ in their roots, some having many long roots, as fig oak plane ; for the roots of these, if they have room, run to any length. Others again have few roots, as pomegranate and apple, others a single root, as silver-fir and fir ; these have a single root in the sense that they have one long one⁴ which runs deep, and a number of small ones branching from this. Even in some of those which have more than a single root the middle root is the largest and goes deep, for instance, in the almond ; in the olive this central root is small, while the others are larger and, as it were, spread out crab-wise.⁵ Again the roots of some are mostly stout, of some of various degrees of stoutness, as those of bay and olive ; and of some they are all slender, as those of the vine. Roots also differ in degree of smoothness and in density. For the roots of all

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πυκνότεραι δὲ ἄλλαι ἄλλων καὶ ξυλωδέστεραι· καὶ αἱ μὲν ἴνωδεις, ὡς αἱ τῆς ἐλάτης, αἱ δὲ σαρκώδεις μᾶλλον, ὥσπερ αἱ τῆς δρυός, αἱ δὲ οἰον δέξιώδεις καὶ θυσανωδεις, ὥσπερ αἱ τῆς ἐλάας· τοῦτο δὲ ὅτι τὰς λεπτὰς καὶ μικρὰς πολλὰς ἔχουσι καὶ ἀθρόας· ἐπεὶ πᾶσαι γε καὶ ταύτας ἀποφύουσιν ἀπὸ τῶν μεγάλων ἄλλ' οὐχ ὁμοίως ἀθρόας καὶ πολλάς.

Ἐστι δὲ καὶ τὰ μὲν βαθύρριζα, καθάπερ δρῦς, τὰ δὲ ἐπιπολαιόρριζα, καθάπερ ἐλάα ροιὰ μηλέα κυπάριττος. ἔτι δὲ αἱ μὲν εὐθεῖαι καὶ ὁμαλεῖς, αἱ δὲ σκολιαὶ καὶ παραλλάττουσαι· τοῦτο γὰρ οὐ μόνον συμβαίνει διὰ τοὺς τόπους τῷ μὴ εὐδεῖν ἄλλὰ καὶ τῆς φύσεως αὐτῆς ἐστιν, ὥσπερ ἐπὶ τῆς δάφνης καὶ τῆς ἐλάας· ή δὲ συκῆ καὶ τὰ τοιαῦτα σκολιοῦται διὰ τὸ μὴ εὐδεῖν.

5 "Απασαι δ' ἔμμητροι καθάπερ καὶ τὰ στελέχη καὶ οἱ ἀκρεμόνες· καὶ εὐλογον ἀπὸ τῆς ἀρχῆς. εἰσὶ δὲ καὶ αἱ μὲν παραβλαστητικαὶ εἰς τὸ ἄνω, καθάπερ ἀμπέλου ρόας, αἱ δὲ ἀπαράβλαστοι, καθάπερ ἐλάτης κυπαρίττου πεύκης. αἱ αὐταὶ δὲ διαφοραὶ καὶ τῶν φρυγανικῶν καὶ τῶν ποιωδῶν καὶ τῶν ἄλλων· πλὴν εἰ δλως ἔνια μὴ ἔχει, καθάπερ ὕδνον μύκης πέζις κεραύνιον. τὰ μὲν πολύρριζα καθάπερ πυρὸς τίφη κριθή, πᾶν τὸ τοιοῦτο, καθάπερ εἰκαζούσαις· τὰ δὲ ὀλιγόρριζα 6 καθάπερ τὰ χεδροπά. σχεδὸν δὲ καὶ τῶν λαχανῶδῶν τὰ πλεῖστα μονόρριζα, οἷον ράφανος

¹ πέζις κεραύνιον : πύξος κράνιον UΜVAld. ; πέζις conj. Sch. from Athen. 2. 59 ; κεραύνιον conj. W. cf. Plin. 3. 36 and 37, Juv. 5. 117. ² εἰκαζούσαις : word corrupt ; so UΜVAld.

³ Plin. 19. 98.

plants are less dense than the parts above ground, but the density varies in different kinds, as also does the woodiness. Some are fibrous, as those of the silver-fir, some fleshier, as those of the oak, some are as it were branched and tassel-like, as those of the olive; and this is because they have a large number of fine small roots close together; for all in fact produce these from their large roots, but they are not so closely matted nor so numerous in some cases as in others.

Again some plants are deep-rooting, as the oak, and some have surface roots, as olive pomegranate apple cypress. Again some roots are straight and uniform, others crooked and crossing one another. For this comes to pass not merely on account of the situation because they cannot find a straight course; it may also belong to the natural character of the plant, as in the bay and the olive; while the fig and such like become crooked because they can not find a straight course.

All roots have core, just as the stems and branches do, which is to be expected, as all these parts are made of the same materials. Some roots again have side-growths shooting upwards, as those of the vine and pomegranate, while some have no side-growth, as those of silver-fir cypress and fir. The same differences are found in under-shrubs and herbaceous plants and the rest, except that some have no roots at all, as truffle mushroom bullfist¹ 'thunder-truffle.' Others have numerous roots, as wheat one-seeded wheat barley and all plants of like nature, for instance,² Some have few roots, as leguminous plants.³ And in general most of the pot-herbs have single roots, as cabbage beet celery

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τεῦτλον σέλινον λάπαθος· πλὴν ἔνια καὶ ἀποφύάδας ἔχει μεγάλας, οἷον τὸ σέλινον καὶ τὸ τεῦτλον· καὶ ὡς ἀν κατὰ λόγου ταῦτα βαθυρριζότερα τῶν δένδρων. εἰσὶ δὲ τῶν μὲν σαρκώδεις, καθάπερ ῥαφανίδος γογγυλίδος ἄρου κρόκου· τῶν δὲ ἔνδικτοις, οἷον εὐξάμου ὡκίμου· καὶ τῶν ἀγρίων δὲ τῶν πλείστων, ὅσων μὴ εὐθὺς πλείους καὶ σχιζόμεναι, καθάπερ πυροῦ κριθῆς καὶ τῆς καλουμένης πόας. αὕτη γὰρ ἐν τοῖς ἐπετείοις καὶ ἐν τοῖς ποιώδεσιν ἡ διαφορὰ τῶν ῥιζῶν ὥστε τὰς μὲν εὐθὺς σχίζεσθαι πλείους οὔσας καὶ ὄμαλεῖς, τῶν δὲ ἄλλων μίαν ἡ δύο τὰς μεγίστας καὶ ἄλλας ἀπὸ τούτων.

7 "Ολως δὲ πλείους αἱ διαφοραὶ τῶν ῥιζῶν ἐν τοῖς ὑλήμασι καὶ λαχανώδεσιν εἰσὶ γὰρ αἱ μὲν ἔνδικτοις, ὥσπερ αἱ τοῦ ὡκίμου· αἱ δὲ σαρκώδεις, ὥσπερ αἱ τοῦ τεῦτλον καὶ ἔτι δὴ μᾶλλον τοῦ ἄρου καὶ ἀσφοδέλου καὶ κρόκου· αἱ δὲ ὥσπερ ἐκ φλοιοῦ καὶ σαρκός, ὥσπερ αἱ τῶν ῥαφανίδων καὶ γογγυλίδων· αἱ δὲ γονατώδεις, ὥσπερ αἱ τῶν καλάμων καὶ ἀγρώστεων καὶ εἴ τι καλαμῶδεις, καὶ μόναι δὴ αὗται ἡ μάλισθ' ὅμοιαι τοῖς ὑπὲρ γῆς· ὥσπερ γὰρ κάλαμοί εἰσιν ἐρριζωμένοι ταῖς λεπταῖς. αἱ δὲ λεπυρώδεις ἡ φλοιώδεις, οἷον αἱ τε τῆς σκίλλης καὶ τοῦ βολβοῦ καὶ ἔτι κρομύου καὶ τῶν τούτοις ὁμοίων. αἱεὶ γὰρ ἔστι περιαιρεῖν αὐτῶν.

8 Πάντα δὲ τὰ τοιαῦτα δοκεῖ καθάπερ δύο γένη ῥιζῶν ἔχειν· τοῖς δὲ καὶ ὅλως τὰ κεφαλοβαρῆ καὶ κατάρριζα πάντα· τήν τε σαρκώδη ταύτην

¹ The same term being applied to 'herbaceous' plants in general.

² Plin. 19. 98.

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monk's rhubarb; but some have large side-roots, as celery and beet, and in proportion to their size these root deeper than trees. Again of some the roots are fleshy, as in radish turnip cuckoo-pint crocus; of some they are woody, as in rocket and basil. And so with most wild plants, except those whose roots are to start with numerous and much divided, as those of wheat barley and the plant specially¹ called 'grass.' For in annual and herbaceous plants this is the difference between the roots:—Some are more numerous and uniform and much divided to start with, but the others have one or two specially large roots and others springing from them.

To speak generally, the differences in roots are more numerous in shrubby plants and pot-herbs;² for some are woody, as those of basil, some fleshy, as those of beet, and still more those of cuckoo-pint asphodel and crocus; some again are made, as it were, of bark and flesh, as those of radishes and turnips; some have joints, as those of reeds and dog's tooth grass and of anything of a reedy character; and these roots alone, or more than any others, resemble the parts above ground; they are in fact like³ reeds fastened in the ground by their fine roots. Some again have scales or a kind of bark, as those of squill and purse-tassels, and also of onion and things like these. In all these it is possible to strip off a coat.

Now all such plants, seem, as it were, to have two kinds of root; and so, in the opinion of some, this is true generally of all plants which have a solid 'head'⁴ and send out roots from it downwards. These have,

³ i.e. the main root is a sort of repetition of the part above ground. ⁴ i.e. bulb, corm, rhizome, etc.

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καὶ φλοιώδη, καθάπερ ἡ σκίλλα, καὶ τὰς ἀπὸ ταύτης ἀποπεφυκύιας· οὐ γὰρ λεπτότητι καὶ παχύτητι διαφέρουσι μόνου, ὥσπερ αἱ τῶν δένδρων καὶ τῶν λαχάνων, ἀλλ' ἀλλοῖον ἔχουσι τὸ γένος. ἐκφανεστάτη δ' ἡδη ἡ τε τοῦ ἄρουν καὶ ἡ τοῦ κυπείρου· ἡ μὲν γὰρ παχεῖα καὶ λεία καὶ σαρκώδης, ἡ δὲ λεπτὴ καὶ ἴνωδης. διόπερ ἀπορήσειεν ἄν τις εἰ ῥίζας τὰς τοιαύτας θετέον· ἡ μὲν γὰρ κατὰ γῆς δόξαιεν ἄν, ἡ δὲ ὑπεναυτίως ἔχουσι ταῖς ἄλλαις οὐκ ἀν δόξαιεν. ἡ μὲν γὰρ ῥίζα λεπτότερα πρὸς τὸ πόρρω καὶ ἀεὶ σύνοξυς· ἡ δὲ τῶν σκιλλῶν καὶ τῶν βολβῶν καὶ τῶν ἄρων ἀνάπαλιν.

9 Ἐπι δ' αἱ μὲν ἄλλαι κατὰ τὸ πλάγιον ἀφιᾶσι ῥίζας, αἱ δὲ τῶν σκιλλῶν καὶ τῶν βολβῶν οὐκ ἀφιᾶσιν· οὐδὲ τῶν σκορόδων καὶ τῶν κρομύων. δλως δέ γε ἐν ταύταις αἱ κατὰ μέσον ἐκ τῆς κεφαλῆς ἡρτημέναι φαίνονται ῥίζαι καὶ τρέφονται. τοῦτο δ' ὥσπερ κῦμα ἡ καρπός, ὅθεν καὶ οἱ ἐγγεοτόκα λέγοντες οὐ κακῶς· ἐπὶ δὲ τῶν ἄλλων τοιοῦτο μὲν οὐδέν ἐστιν· ἐπεὶ δὲ πλεῖον ἡ φύσις ἡ κατὰ ῥίζαν ταύτη ἀπορίαν ἔχει. τὸ γὰρ δὴ πᾶν λέγειν τὸ κατὰ γῆς ῥίζαν οὐκ ὄρθον· καὶ γὰρ ἀν ὁ καυλὸς τοῦ βολβοῦ καὶ ὁ τοῦ γηθύον καὶ

¹ τὰς conj. Sch.; τῆς Ald.H.; τὴν . . . ἀποπεφυκύιαν P.

² ἀλλ' ἀλλοῖον ἔχουσι conj. St.; ἀλλὰ λεῖον ἔχοντες PMV Ald.; ἀλλοῖον ἔχ. mBas.mP from G; ³ ἀλλ' ἀλλοῖον ἔχουσαι conj. Scal.

⁴ καὶ ἀεὶ Ald.; ἀεὶ καὶ conj. W.

⁵ Plin. 19. 99.

⁶ cf. the definition of 'root,' I. 1. 9.

⁷ ἐγγεότοκα λέγοντες conj. W.; c. ἡ τῶν ἐγγεοτόκων τούτων γένεσις in Athenaeus' citation of this passage (2. 60);

that is to say, this fleshy or bark-like root, like squill, as well as the¹ roots which grow from this. For these roots not only differ in degree of stoutness, like those of trees and pot-herbs; they are of quite distinct classes.² This is at once quite evident in cuckoo-pint and galingale,³ the root being in the one case thick smooth and fleshy, in the other thin and fibrous. Wherefore we might question if such roots should be called 'roots'; inasmuch as they are under ground they would seem to be roots, but, inasmuch as they are of opposite character to other roots, they would not. For your root gets slenderer as it gets longer and tapers continuously⁴ to a point; but the so-called root of squill purse-tassels and cuckoo-pint does just the opposite.

Again, while the others send out roots at the sides, this is not the case⁵ with squill and purse-tassels, nor yet with garlic and onion. In general in these plants the roots which are attached to the 'head' in the middle appear to be real roots and receive nourishment,⁶ and this 'head' is, as it were, an embryo or fruit; wherefore those who call such plants 'plants which reproduce themselves underground'⁷ give a fair account of them. In other kinds of plants there is nothing of this sort.⁸ But a difficult question is raised, since here the 'root' has a character which goes beyond what one associates with roots. For it is not right to call all that which is underground 'root,' since in that case the stalk⁹ of purse-tassels and that of long onion and in general any part which is under-

εντεοσ οισαλεγοντες U; *Ἐν τε τοῖς δστοῖς ἀλέγοντες* MV (omitting *τε*) Ald. (omitting *τοῖς*).

⁸ *τοιοῦτο μὲν οὐδέν* conj. W.; *τοῦτο μὲν* MSS.

⁹ *Ἐν δ καυλός* conj. St.; *ἀνδκαυλος* Ald.

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ὅλως ὅσα κατὰ βάθους ἔστιν εἴησαν ἀν ρίζαι,
καὶ τὸ ὕδνον δὲ καὶ ὁ καλοῦσί τινες ἀσχίον καὶ
τὸ οὐγγον καὶ εἴ τι ἄλλο ὑπόγειόν ἔστιν· ὃν
οὐδέν ἔστι ρίζα· δυνάμει γὰρ δεῖ φυσικῇ διαιρεῖν
καὶ οὐ τόπῳ.

10 Τάχα δὲ τοῦτο μὲν ὄρθως λέγεται, ρίζα δὲ οὐδὲν
ἡττόν ἔστιν· ἄλλὰ διαφορά τις αὗτη τῶν ρίζων,
ὅστε τὴν μέν τινα τοιαύτην εἶναι τὴν δὲ τοιαύτην
καὶ τρέφεσθαι τὴν ἐτέραν ὑπὸ τῆς ἐτέρας. καίτοι
καὶ αὐτὰὶ αἱ σαρκώδεις ἐοίκασιν ἔλκειν. τὰς
γοῦν τῶν ἄρων πρὸ τοῦ βλαστάνειν στρέφουσι
καὶ γίγνονται μείζους κωλυόμεναι διαβῆναι πρὸς
τὴν βλάστησιν. ἐπεὶ δτι γε πάντων τῶν τοιού-
των ἡ φύσις ἐπὶ τὸ κάτω μᾶλλον ρέπει φανερόν·
οἱ μὲν γὰρ καυλοὶ καὶ ὅλως τὰ ἄνω βραχέα καὶ
ἀσθενῆ, τὰ δὲ κάτω μεγάλα καὶ πολλὰ καὶ
ἰσχυρὰ οὐ μόνον ἐπὶ τῶν εἱρημένων ἄλλὰ καὶ ἐπὶ⁵
καλάμου καὶ ἀγρώστιδος καὶ ὅλως ὅσα καλαμώδη
καὶ τούτοις ὅμοια. καὶ ὅσα δὴ ναρθηκώδη, καὶ
τούτων ρίζαι μεγάλαι καὶ σαρκώδεις.

11 Πολλὰ δὲ καὶ τῶν ποιωδῶν ἔχει τοιαύτας ρίζας,
οἷον σπάλαξ κρόκος καὶ τὸ περδίκιον καλούμενον·
καὶ γὰρ τοῦτο παχείας τε καὶ πλείους ἔχει τὰς
ρίζας ἡ φύλλα· καλεῖται δὲ περδίκιον διὰ τὸ τοὺς
πέρδικας ἐγκυλίεσθαι καὶ ὄρύττειν. ὅμοίως δὲ

¹ *βάθος* conj. Sch.; *βάθος* Ald.

² καὶ ὁ W. after U; καὶ om. Ald.; G omits also τὸ before οὐγγον, making the three plants synonymous. The passage is cited by Athen., *l.c.*, with considerable variation.

³ *τοιαύτην* conj. St.; *τοσαύτην* MSS.

⁴ i.e. the fleshy root (tuber, etc.).

⁵ i.e. the fibrous root (root proper).

ground¹ would be a root, and so would the truffle, the plant which² some call puff-ball, the *wingon*, and all other underground plants. Whereas none of these is a root; for we must base our definition on natural function and not on position.

However it may be that this is a true account and yet that such things are roots no less; but in that case we distinguish two different kinds of root, one being of this character³ and the other of the other, and the one⁴ getting its nourishment from the other⁵; though the fleshy roots too themselves seem to draw nourishment. At all events men invert⁶ the roots of cuckoo-pint before it shoots, and so they become larger by being prevented from pushing⁷ through to make a shoot. For it is evident that the nature of all such plants is to turn downwards for choice; for the stems and the upper parts generally are short and weak, while the underground parts are large numerous and strong, and that, not only in the instances given, but in reeds dog's-tooth grass and in general in all plants of a reedy character and those like them. Those too which resemble ferula⁸ have large fleshy roots.

⁹ Many herbaceous plants likewise have such roots, as colchicum¹⁰ crocus and the plant called 'partridge-plant'; for this too has thick roots which are more numerous than its leaves. ¹¹(It is called the 'partridge-plant' because partridges roll in it and grub it up.) So too with the plant called in Egypt

⁶ στρέφουσι conj. Sch.; τρέφουσι MVAld.; cf. 7. 12. 2.

⁷ διαβήναι conj. W.; διαθεῖναι UMV.

⁸ i.e. have a hollow stem (umbelliferous plants, more or less). ⁹ Plin. 19. 99.

¹⁰ σπάλαξ UMV; ἀσπάλαξ mBas.: perhaps corrupt.

¹¹ Plin. 21. 102.

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καὶ τὸ ἐν Αἰγύπτῳ καλούμενον οὐεῖγγον· τὰ μὲν
γὰρ φύλλα μεγάλα καὶ ὁ βλαστὸς αὐτοῦ βραχύς,
ἡ δὲ ρίζα μακρὰ καὶ ἔστιν ὥσπερ ὁ καρπός.
διαφέρει τε καὶ ἐσθίεται, καὶ συλλέγουσι δὲ ὅταν
12 ὁ ποταμὸς ἀποβῆ στρέφοντες τὰς βώλους. φανε-
ρώτατα δὲ καὶ πλείστην ἔχοντα πρὸς τὰ ἄλλα
διαφορὰν τὸ σίλφιον καὶ ἡ καλουμένη μαγύδαρις·
ἀμφοτέρων γὰρ τούτων καὶ ἀπάντων τῶν τοιούτων
ἐν ταῖς ρίζαις μᾶλλον ἡ φύσις. ταῦτα μὲν οὖν
ταύτη ληπτέα.

"Ενιαὶ δὲ τῶν ρίζῶν πλείω δόξαιεν ἀν ἔχειν
διαφορὰν παρὰ τὰς εἰρημένας· οἷον αἱ τε τῆς ἀρα-
χίδινης καὶ τοῦ ὁμοίου τῷ ἀράκῳ· φέρουσι γὰρ
ἀμφότεραι καρπὸν οὐκ ἐλάττω τοῦ ἄνω· καὶ μίαν
μὲν ρίζαν τὸ ἀρακῶδες τούτο παχεῖαν ἔχει τὴν
κατὰ βάθους, τὰς δὲ ἄλλας ἐφ' ὧν ὁ καρπὸς
λεπτοτέρας καὶ ἐπ' ἄκρῳ [καὶ] σχιζομένας πολ-
λαχῆ· φιλεῖ δὲ μάλιστα χωρία τὰ ὑφαμμα· φύλ-
λον δὲ οὐδέτερον ἔχει τοιτῶν οὐδὲ ὅμοια τοῖς
φύλλοις, ἀλλ' ὥσπερ ἀμφίκαρπα μᾶλλον ἔστιν· δ
καὶ φαίνεται θαυμάσιον. αἱ μὲν οὖν φύσεις
καὶ δυνάμεις τοσαύτας ἔχουσι διαφοράς.

VII. Αὐξάνεσθαι δὲ πάντων δοκοῦσιν αἱ ρίζαι
πρότερον τῶν ἄνω· καὶ γὰρ φύεται εἰς βάθος·
οὐδεμία δὲ καθήκει πλέον ἡ ὅσον ὁ ἥλιος ἐφικνεῖ-
ται· τὸ γὰρ θερμὸν τὸ γεννῶν· οὐ μὴν ἀλλὰ

¹ οὐεῖγγον mBas.H.; οὐεῖτον MV; ουεῖτον Ald.; cf. 1. 1. 7;
Plin. 21. 88 (oetum).

² μεγάλα: text doubtful (W.).

³ διαφέρει: text doubtful (Sch.).

⁴ στρέφοντες τὰς βώλους conj. Coraës; στέφοντες βωμούς
UMVAld. ⁵ ἐν ins. Sch.

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*uington*¹; for its leaves are large² and its shoots short, while the root is long and is, as it were, the fruit. It is an excellent thing³ and is eaten; men gather it when the river goes down by turning the clods.⁴ But the plants which afford the most conspicuous instances and shew the greatest difference as compared with others are silphium and the plant called *magydaris*; the character of both of these and of all such plants is especially shewn in⁵ their roots. Such is the account to be given of these plants.

Again some roots would seem to shew a greater difference⁶ than those mentioned, for instance, those of *arakhidna*,⁷ and of a plant⁸ which resembles *arakos*. For both of these bear a fruit underground which is as large as the fruit above ground, and this *arakos*-like⁹ plant has one thick root, namely, the one which runs deep, while the others which bear the 'fruit' are slenderer and branch¹⁰ in many directions at the tip. It is specially fond of sandy ground. Neither of these plants has a leaf nor anything resembling a leaf, but they bear, as it were, two kinds of fruit instead, which seems surprising. So many then are the differences shewn in the characters and functions of roots.

VII. The roots of all plants seem to grow earlier than the parts above ground (for growth does take place downwards¹¹). But no root goes down further than the sun reaches, since it is the heat which induces growth. Nevertheless the nature of the soil,

⁶ i.e. to be even more abnormal: διαφορὰν conj. Sch.; διαφοραὶ Ald. ⁷ Plin. 21. 89.

⁸ tine-tare. See Index, App. (1).

⁹ ἀρακάδες conj. Sch.; σαρκάδες Ald.G.

¹⁰ καὶ before σχιζ. om. Sch. from G.

¹¹ cf. C.P. 1. 12. 7. (cited by Varro, 1. 45. 3); 3. 3. 1.

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ταῦτα μεγάλα συμβάλλεται πρὸς βαθυρριζίαν καὶ ἔτι μᾶλλον πρὸς μακρορριζίαν, ἡ τῆς χώρας φύσις ἐὰν ἡ κούφη καὶ μανὴ καὶ εὐδίοδος· ἐν γὰρ ταῖς τοιαύταις πορρωτέρω καὶ μείζους αἱ αὐξήσεις. φανερὸν δὲ ἐπὶ τῶν ἡμερωμάτων ἔχοντα γὰρ ὕδωρ ὅπουοῦν δίεισιν ὡς εἰπεῖν, ἐπειδὰν ὁ τόπος ἡ κενὸς καὶ μηδὲν τὸ ἀντιστατοῦν. ἥγουν ἐν τῷ Λυκείῳ ἡ πλάτανος ἡ κατὰ τὸν ὁχετὸν ἔτι νέα οὐσα ἐπὶ τρεῖς καὶ τριάκοντα πήχεις ἀφῆκεν ἔχουσα τόπον τε ἄμα καὶ τροφήν.

2 Δόξειε δὲ ὡς εἰπεῖν ἡ συκῆ μακρορριζότατον εἶναι καὶ ὅλως δὲ μᾶλλον τὰ μανὰ καὶ εὐθύρριζα. πάντα δὲ τὰ νεώτερα τῶν παλαιῶν, ἐὰν εἰς ἀκμὴν ἥκωσιν, ἥδη βαθυρριζότερα καὶ μακρορριζότερα. συμφθίνουσι γὰρ καὶ αἱ ρίζαι τῷ ἄλλῳ σώματι. πάντων δὲ ὅμοίως οἱ χυλοὶ τοῖς φυτοῖς δεινότεροι, τοῖς δὲ ὡς ἐπίπαν δι' ὅ καὶ ἐνίων πικραὶ ὡν οἱ καρποὶ γλυκεῖς· αἱ δὲ καὶ φαρμακώδεις· ἔνιαι δὲ εὐώδεις, ὥσπερ αἱ τῆς ἵριδος.

3 Ἰδία δὲ ρίζης φύσις καὶ δύναμις ἡ τῆς Ἰνδικῆς συκῆς· ἀπὸ γὰρ τῶν βλαστῶν ἀφίησι, μέχρι οὐ ἀν συνάψη τῇ γῇ καὶ ρίζωθῆ, καὶ γίνεται περὶ τὸ δένδρον κύκλῳ συνεχὲς τὸ τῶν ρίζῶν οὐχ ἀπόμενον τοῦ στελέχους ἀλλ' ἀφεστηκός.

¹ ταῦτα before μέγαλα om. W.

² ἡμερωμάτων conj. Sch.; ἡμερωτάτων UP₂Ald.; cf. C.P. 5. 6. 8.

³ δπουοῦν MSS.; δποσονοῦν conj. W. from G, *in quantum libeat.* ⁴ ἐπειδὰν conj. Sch.; ἐπεὶ καν̄ UMVP Ald.

⁵ Quoted by Varro, 1. 37. 5.

⁶ ἐπὶ conj. Sch.; παρὰ P₂; περὶ Ald.

⁷ συμφθίνουσι: συμφωνοῦσι conj. St.

if it is light open and porous, contributes greatly¹ to deep rooting, and still more to the formation of long roots; for in such soils growth goes further and is more vigorous. This is evident in cultivated plants.² For, provided that they have water, they run on, one may say, wherever it may be,³ whenever⁴ the ground is unoccupied and there is no obstacle.⁵ For instance the plane-tree by the watercourse in the Lyceum when it was still young sent out its roots a distance of⁶ thirty-three cubits, having both room and nourishment.

The fig would seem, one may say, to have the longest roots, and in general plants which have wood of loose texture and straight roots would seem to have these longer. Also young plants, provided that they have reached their prime, root deeper and have longer roots than old ones; for the roots decay along with⁷ the rest of the plant's body. And in all cases alike the juices of plants⁸ are more powerful in the roots than in other parts, while in some cases they are extremely powerful; wherefore the roots are bitter in some plants whose fruits are sweet; some roots again are medicinal, and some are fragrant, as those of the iris.

The character and function of the roots of the 'Indian fig' (banyan) are peculiar, for this plant sends out roots from the shoots till it has a hold on the ground⁹ and roots again; and so there comes to be a continuous circle of roots round the tree, not connected with the main stem but at a distance from it.

⁸ τοῖς φυτοῖς Ald.; ταῖς βίξαις conj. W. from G: text probably defective.

⁹ τῇ γῇ conj. Scal. from G; συκῇ U; τῇ συκῇ P₂Ald.

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Παραπλήσιον δὲ τούτῳ μᾶλλον δὲ τρόπον τινὰ θαυμασιώτερον εἴ τι ἐκ τῶν φύλλων ἀφίησι ρίζαν, ολόν φασι περὶ Ὀποῦντα ποιάριον εἶναι, διὸ καὶ ἐσθίεσθαι ἐστιν ἡδύ. τὸ γὰρ αὖ τῶν θέρμων θαυμαστὸν ἡττον, διτι ἐν ὅλῃ βαθείᾳ σπαρῇ διείρει τὴν ρίζαν πρὸς τὴν γῆν καὶ βλαστάνει διὰ τὴν ἴσχύν. ἀλλὰ δὴ τὰς μὲν τῶν ρίζῶν διαφορὰς ἐκ τούτων θεωρητέον.

VIII. Τῶν δένδρων τὰς τοιαύτας ἄν τις λάβοι διαφοράς. ἔστι γὰρ τὰ μὲν δέκαδη τὰ δ' ἄνοξα καὶ φύσει καὶ τόπῳ κατὰ τὸ μᾶλλον καὶ ἡττον. ἄνοξα δὲ λέγω οὐχ ὥστε μὴ ἔχειν ὅλως—οὐδὲν γὰρ τοιοῦτο δένδρον, ἀλλ' εἴπερ, ἐπὶ τῶν ἄλλων οἰον σχοῖνος τύφη κύπειρος ὅλως ἐπὶ τῶν λιμνώδῶν—ἀλλ' ὥστε ὀλίγους ἔχειν. φύσει μὲν οἰον ἀκτὴ δάφνη συκῆ ὅλως πάντα τὰ λειόφλοια καὶ ὅσα κοῖλα καὶ μανά. δέκαδες δὲ ἐλάα πεύκη κότινος· τούτων δὲ τὰ μὲν ἐν παλισκίοις καὶ νηνέμοις καὶ ἐφύδροις, τὰ δὲ ἐν εὐηλίοις καὶ χειμερίοις καὶ πνευματώδεσι καὶ λεπτοῖς καὶ ξηροῖς· τὰ μὲν γὰρ ἀνοξότερα, τὰ δὲ δέκαδέστερα τῶν

¹ τι conj. W.; τις MSS. ² Plin. 21. 104.

³ cf. 8. 11. 8; Plin. 18. 133 and 134.

⁴ διείρει conj. Sch.; διαιρεῖ P₂Ald.; cf. C.P. 2. 17. 7.

⁵ δέκος is the knot and the bough starting from it: cf. Arist. de iuv. et sen. 3.

⁶ ἐπὶ τῶν conj. Coraës; ἡ τῶν UM; ἡττον (erased) P (ἐκ τῶν marg.) ἡττον Ald.

Something similar to this, but even more surprising, occurs in those plants which¹ emit roots from their leaves, as they say does a certain herb² which grows about Opus, which is also sweet to taste. The peculiarity again of lupins³ is less surprising, namely that, if the seed is dropped where the ground is thickly overgrown, it pushes⁴ its root through to the earth and germinates because of its vigour. But we have said enough for study of the differences between roots.

Of trees (principally) and their characteristic special differences: as to knots.

VIII. One may take it that the following are the differences between trees:—Some have knots,⁵ more or less, others are more or less without them, whether from their natural character or because of their position. But, when I say ‘without knots,’ I do not mean that they have no knots at all (there is no tree like that, but, if it is true of any plants, it is only of⁶ other kinds, such as rush bulrush⁷ galingale and plants of the lake side⁸ generally) but that they have few knots. Now this is the natural character of elder bay fig and all smooth-barked trees, and in general of those whose wood is hollow or of a loose texture. Olive fir and wild olive have knots; and some of these grow in thickly shaded windless and wet places, some in sunny positions exposed to storms and winds,⁹ where the soil is light and dry; for the number of knots varies between trees of the

⁷ τέφη conj. Bod.; τίφη U Ald. H.; cf. 1. 5. 3.

⁸ ἐπὶ τῶν conj. W.; εἰ τι ἐπὶ τῶν Ald.

⁹ πνευματώδεσι conj. Scal.; πυματώδεσι U; πυγματώδεσι MVAld.

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όμοιγενῶν. ὅλως δὲ ὁζωδέστερα τὰ ὄρεινὰ τῶν πεδεινῶν καὶ τὰ ξηρὰ τῶν ἐλείων.

2 Ἔτι δὲ κατὰ τὴν φυτείαν τὰ μὲν πυκνὰ ἄνοξα καὶ ὄρθα, τὰ δὲ μανὰ ὁζωδέστερα καὶ σκολιώτερα· συμβαίνει γὰρ ὥστε τὰ μὲν ἐν παλισκίῳ εἶναι τὰ δὲ ἐν εὐηλίῳ. καὶ τὰ ἄρρενα δὲ τῶν θηλειῶν ὁζωδέστερα ἐν οἷς ἐστιν ἄμφω, οἷον κυπάριστος ἐλάτη ὀστρυῖς κρανείᾳ· καλοῦσι γὰρ γένος τι θηλυκρανείαν· καὶ τὰ ἄγρια δὲ τῶν ἡμέρων, καὶ ἀπλῶς καὶ τὰ ὑπὸ ταύτῳ γένος, οἷον κότινος ἐλάσας καὶ ἐρινεὸς συκῆς καὶ ἀχρὰς ἀπίου. πάντα γὰρ ταῦτα ὁζωδέστερα· καὶ ὡς ἐπὶ τὸ πολὺ πάντα τὰ πυκνὰ τῶν μανῶν· καὶ γὰρ τὰ ἄρρενα πυκνότερα καὶ τὰ ἄγρια· πλὴν εἴ τι διὰ πυκνότητα παντελῶς ἄνοξον ἡ ὀλίγοξον, οἷον πύξος λωτός.

3 Εἰσὶ δὲ τῶν μὲν ἄτακτοι καὶ ὡς ἔτυχεν οἱ ὅξοι, τῶν δὲ τεταγμένοι καὶ τῷ διαστήματι καὶ τῷ πλήθει καθάπερ εἴρηται· δὶς δὲ καὶ ταξιόζωτα ταῦτα καλοῦσιν. τῶν μὲν γὰρ οἷον δὶς ἵσου τῶν δὲ μεῖζον αἰὲν τὸ πρὸς τῷ πάχει. καὶ τοῦτο κατὰ λόγον. ὅπερ μάλιστα ἔνδηλον καὶ ἐν τοῖς κοτίνοις καὶ ἐν τοῖς καλάμοις· τὸ γὰρ γόνυ καθάπερ ὅξος. καὶ οἱ μὲν κατ' ἀλλήλους, ὥσπερ οἱ τῶν

¹ Plin. 16. 125.

² 1. 8. 1.

³ ταξιόζωτα conj. W.; ἀξιολογώτατα Ald.; cf. ταξίφυλλος, 1. 10. 8. ⁴ Plin. 16. 122.

same kind. And in general mountain trees have more knots than those of the plain, and those that grow in dry spots than those that grow in marshes.

Again the way in which they are planted makes a difference in this respect; those trees that grow close together are knotless and erect, those that grow far apart have more knots and a more crooked growth; for it happens that the one class are in shade, the others in full sun. Again the 'male' trees have more knots than the 'female' in those trees in which both forms are found, as cypress silver-fir hop-horn-beam cornelian cherry—for there is a kind called 'female cornelian cherry' (cornel)—and wild trees have more knots than trees in cultivation: this is true both in general and when we compare those of the same kind, as the wild and cultivated forms of olive fig and pear. All these have more knots in the wild state; and in general those of closer growth have this character more than those of open growth; for in fact the 'male' plants are of closer growth, and so are the wild ones; except that in some cases, as in box and nettle-tree, owing to the closer growth there are no knots at all, or only a few.

¹ Again the knots of some trees are irregular and set at haphazard, while those of others are regular, alike in their distance apart and in their number, as has been said²; wherefore also they are called 'trees with regular knots.'³ ⁴ For of some the knots are, as it were, at even distances, while in others the distance between them is greater at the thick end of the stem. And this proportion holds throughout. This is especially evident in the wild olive and in reeds—in which the joint corresponds to the knot in trees. Again some knots are opposite one another,

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κοτίνων, οἱ δ' ὡς ἔτυχεν. ἔστι δὲ τὰ μὲν δίοζα, τὰ δὲ τρίοζα, τὰ δὲ πλείους ἔχοντα· ἔνια δὲ πεντάοζά ἔστι. καὶ τῆς μὲν ἐλάτης ὄρθοι καὶ οἱ ὅζοι καὶ οἱ 4 κλάδοι ὥσπερ ἐμπεπηγότες, τῶν δὲ ἄλλων οὐ. δι' ὁ καὶ ἴσχυρὸν ἡ ἐλάτη. ἴδιώτατοι δὲ οἱ τῆς μηλέας ὅμοιοι γάρ θηρίων προσώποις, εἰς μὲν ὁ μέγιστος ἄλλοι δὲ περὶ αὐτὸν μικροὶ πλείους. εἰσὶ δὲ τῶν ὅζων οἱ μὲν τυφλοί, οἱ δὲ γόνυμοι. λέγω δὲ τυφλοὺς ἀφ' ὧν μηδεὶς βλαστός. οὗτοι δὲ καὶ φύσει καὶ πηρώσει γίνονται, ὅταν ἡ μὴ λυθῆ καὶ ἐκβιάζηται ἡ καὶ ἀποκοπῆ καὶ οἶον ἐπικαυθεὶς πηρωθῆ. γίνονται δὲ μᾶλλον ἐν τοῖς παχέσι τῶν ἀκρεμόνων, ἐνίων δὲ καὶ ἐν τοῖς στελέχεσιν. ὅλως δὲ καὶ τοῦ στελέχους καὶ τοῦ κλάδου καθ' ὁ ἀν ἐπικόψη ἡ ἐπιτέμη τις, ὅζος γίνεται καθαπερανεὶ διαιρῶν τὸ ἐν καὶ ποιῶν ἐτέραν ἀρχήν, εἴτε διὰ τὴν πήρωσιν εἴτε δι' ἄλλην αἰτίαν· οὐ γάρ δὴ κατὰ φύσιν τὸ ὑπὸ τῆς πληγῆς.

5 Αἱὲν δὲ ἐν ἄπασιν οἱ κλάδοι φαίνονται πολυοζότεροι διὰ τὸ μήπω τάνα μέσον προσηγνησθαι, καθάπερ καὶ τῆς συκῆς οἱ νεόβλαστοι τραχύτατοι καὶ τῆς ἀμπέλου τὰ ἄκρα τῶν κλημάτων. ὡς γάρ ὅζος ἐν τοῖς ἄλλοις οὕτω καὶ ὀφθαλμὸς

¹ cf. 4. 4. 12. ² Plin. 16. 122.

³ i.e. primary and secondary branches.

⁴ cf. 5. 2. 2. ⁵ Plin. 16. 124.

⁶ cf. Arist. *de iuv. et sen.* 3; Plin. 16. 125.

⁷ ὅταν . . . πηρωθῆ conj. W.; ἡ ὅταν ἡ μὴ λυθῆ καὶ ἐκβιάζηται καὶ ἡ ἀποκοπῆ καὶ Ζ; ὅταν ἡ μὴ λυθῆ καὶ ἐκβιάζηται ἡ ἀποκοπῆ Ζ; ἡ ὅταν λυθῆ καὶ ἐκβιάζηται ἡ ἀποκοπῆ καὶ οἱ οὐ Ρ₂; ὅταν ἡ μὴ λυθῆ καὶ ἐκβιάζηται καὶ ἡ ἀποκοπῆ καὶ Ald. H.; Ζ differs widely.

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as those of the wild olive, while others are set at random. Again some trees have double knots, some treble,¹ some more at the same point; some have as many as five. ² In the silver-fir both the knots and the smaller branches³ are set at right angles, as if they were stuck in, but in other trees they are not so. And that is why the silver-fir is such a strong tree.⁴ Most peculiar⁵ are the knots of the apple, for they are like the faces of wild animals; there is one large knot, and a number of small ones round it. Again some knots are blind,⁶ others productive; by 'blind' I mean those from which there is no growth. These come to be so either by nature or by mutilation, according as either the knot⁷ is not free and so the shoot does not make its way out, or, a bough having been cut off, the place is mutilated, for example by burning. Such knots occur more commonly in the thicker boughs, and in some cases in the stem also. And in general, wherever one chops or cuts part of the stem or bough, a knot is formed, as though one thing were made thereby into two and a fresh growing point produced, the cause being the mutilation or some other such reason; for the effect of such a blow cannot of course be ascribed to nature.

Again in all trees the branches always seem to have more knots, because the intermediate parts⁸ have not yet developed, just as the newly formed branches of the fig are the roughest,⁹ and in the vine the highest¹⁰ shoots. ¹¹ (For to the knot in other

⁸ i.e. the internodes; till the branch is fully grown its knots are closer together, and so seem more numerous: *μήπω τὰνά μέσον προσηκῆσθαι* conj. Sch.; *μήπω τὰνά μέσον προσκυ-ζῆσθαι* U; *μήτ' ἀνά μέσον προσκυζεῖσθαι* MAld.; *μήποτ' ἀνάμεσον προσηκῆσθαι* P₂. ⁹ i.e. have most knots.

¹⁰ i.e. youngest.

¹¹ Plin. 16. 125.

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ἐν ἀμπέλῳ καὶ ἐν καλάμῳ γόνυ . . . ἐνίοις δὲ καὶ οἷον κράδαι γίνονται, καθάπερ πτελέᾳ καὶ δρυὶ καὶ μάλιστα ἐν πλατάνῳ· ἐὰν δὲ ἐν τραχέσι καὶ ἀνύδροις καὶ πνευματώδεσι καὶ παντελῶς. πάντως δὲ πρὸς τὴν γῆν καὶ οἷον τὴν κεφαλὴν τοῦ στελέχους ἀπογηράσκοντων τὸ πάθος τοῦτο γίνεται.

ε. Ἐνια δὲ καὶ ἵσχει τοὺς καλουμένους ὑπό τινων ἡ γόγγρους ἡ τὸ ἀνάλογον, οἷον ἡ ἐλάα· κυριώτατον γάρ ἐπὶ ταύτης τοῦτο τούνομα καὶ πάσχειν δοκεῖ μάλιστα τὸ εἰρημένον· καλοῦσι δὲ ἐνιοι τοῦτο πρέμνον οἱ δὲ κροτώνην οἱ δὲ ἄλλο ὄνομα. τοῖς δὲ εὐθέσι καὶ μονορρίζοις καὶ ἀπαραβλάστοις οὐ γίνεται τοῦθ' ὅλως ἡ ἡττον· [φοῖνιξ δὲ παραβλαστητικόν·] ἡ δὲ ἐλάα καὶ ὁ κότινος καὶ τὰς οὐλότητας ἴδιας ἔχουσι τὰς ἐν τοῖς στελέχεσι.

IX. Ἐστι μὲν οὖν τὰ μὲν ὡς εἰς μῆκος αὐξητικὰ μάλιστ' ἡ μόνον, οἷον ἐλάτη φοῖνιξ κυπάριυτος καὶ ὅλως τὰ μονοστελέχη καὶ ὅσα μὴ πολύρριζα μηδὲ πολύκλαδα· <ἡ δὲ φοῖνιξ ἀπαραβλαστητικόν·> τὰ δὲ ὄμοια τούτοις ἀνὰ λόγον καὶ εἰς βάθος. ἔνια δὲ εὐθὺς σχίζεται, οἷον ἡ

¹ The opening of the description of the diseases of trees seems to have been lost. ² κράδαι; cf. C.P. 5. 1. 3.

³ πάντως . . . γίνεται conj. W.; πάντως δὲ δὲ πρὸς τὴν γῆν καὶ οἷον τ. κ. στ. ἀπογηράσκων τῶν παχυτέρων γίνεται Ald.; so U except παχύτερον, and M except παχύτερος.

⁴ γόγγρους: cf. Hesych., s.vv. γόγγρος, κροτώνη.

⁵ The word is otherwise unknown.

⁶ ἡττον· ἡ δὲ ἐλάα conj. W.; ἡττον· ἡ δὲ φοῖνιξ πάραβλαστητικόν· ἡ δὲ ἐλάα U; so Ald. except παραβλαστικόν. The

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trees correspond the 'eye' in the vine, the joint in the reed). . . .¹ In some trees again there occurs, as it were, a diseased formation of small shoots,² as in elm oak and especially in the plane; and this is universal if they grow in rough waterless or windy spots. Apart from any such cause³ this affection occurs near the ground in what one may call the 'head' of the trunk, when the tree is getting old.

Some trees again have what are called by some 'excrescences'⁴ (or something corresponding), as the olive; for this name belongs most properly to that tree, and it seems most liable to the affection; and some call it 'stump,' some *krotone*,⁵ others have a different name for it. It does not occur, or only occurs to a less extent, in straight young trees, which have a single root and no side-growths. To the olive⁶ also, both wild and cultivated, are peculiar certain thickenings⁷ in the stem.

As to habit.

IX. ⁸ Now those trees which grow chiefly or only⁹ in the direction of their height are such as silver-fir date-palm cypress, and in general those which have a single stem and not many roots or branches (the date-palm, it may be added, has no side-growths at all¹⁰). And trees like¹¹ these have also similar growth downwards. Some however divide from the first,

note about the palm (*φοῖνιξ δὲ παραβλαστητικόν*) I have omitted as untrue as well as irrelevant; possibly with *ἀπαραβα*. for *παραβα*. it belongs to the next section.

⁷ οὐλότητας conj. W.; κοιλότητας MSS. (?) Ald.

⁸ Plin. 16. 125.

⁹ μάλιστ' ἡ μόνον conj. W.; μάλιστα μανὰ Ald. H.

¹⁰ See 3. 8. 6. n.

¹¹ δμοια conj. Sch.; δμοίως MSS. Sense hardly satisfactory.

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μηλέα· τὰ δὲ πολύκλαδα καὶ μείζω τὸν ὅγκον
ἔχει τὸν ἄνω, καθάπερ ρόα· οὐ μὴν ἀλλ' οὐν
μέγιστά γε συμβάλλεται πρὸς ἔκαστον ἡ ἀγωγὴ
καὶ ὁ τόπος καὶ ἡ τροφή. σημεῖον δὲ ὅτι ταῦτα
πυκνὰ μὲν ὄντα μακρά καὶ λεπτὰ γίνεται, μανὰ
δὲ παχύτερα καὶ βραχύτερα· καὶ ἐὰν μὲν εὐθύς
τις ἀφιῇ τοὺς ὅζους βραχέα, ἐὰν δὲ ἀνακαθαίρῃ
μακρά, καθάπερ ἡ ἄμπελος.

2 Ἰκανὸν δὲ κάκεῖνο πρὸς πίστιν ὅτι καὶ τῶν
λαχάνων ἔνια λαμβάνει δένδρον σχῆμα, καθάπερ
εἴπομεν τὴν μαλάχην καὶ τὸ τεῦτλον¹ ἄπαντα
δὲ ἐν τοῖς οἰκείοις τόποις εὐαυξῆ² . . . καὶ τὸ αὐτὸν
κάλλιστον. ἐπεὶ καὶ τῶν ὁμογενῶν ἀνοξότερα
καὶ μείζω καὶ καλλίω τὰ ἐν τοῖς οἰκείοις, οἷον
ἐλάτη ἡ Μακεδονικὴ τῆς Παρνασίας καὶ τῶν ἀλ-
λῶν. ἄπαντα δὲ ταῦτα καὶ δλως ἡ ὑλη ἡ ἀγρία
καλλίων καὶ πλείων τοῦ δρους ἐν τοῖς προσβο-
ρείοις ἡ ἐν τοῖς πρὸς μεσημβρίαν.

3 Ἐστι δὲ τὰ μὲν ἀείφυλλα τὰ δὲ φυλλο-
βόλα. τῶν μὲν ἡμέρων ἀείφυλλα ἐλάα φοῖνιξ³
δάφνη μύρρινος πεύκης τι γένος κυπάριστος· τῶν
δὲ ἀγρίων ἐλάτη πεύκη ἄρκευθος μίλος θυία καὶ
ἥν Ἀρκάδες καλοῦσι φελλόδρυν φιλυρέα κέδρος
πίτυς ἀγρία μυρίκη πύξος πρῖνος κήλαστρον
φιλύκη ὄξυάκανθος ἀφάρκη, ταῦτα δὲ φύεται
περὶ τὸν Ὀλυμπὸν, ἀνδράχλη κόμαρος τέρμινθος

¹ οὖν marked as doubtful in U. ² 1. 3. 2.

³ καὶ τὸ αὐτὸν κάλλιστον. The first part of the sentence to which these words belong is apparently lost (W.).

⁴ i.e. the fir and other trees mentioned in the lost words.

⁵ Plin. 16. 80.

⁶ μίλος conj. Sch.; σμίλαξ P₂Ald.; cf. 3. 3. 3.

ENQUIRY INTO PLANTS, I. ix. 1-3

such as apple; some have many branches, and their greater mass of growth high up, as the pomegranate: however¹ training position and cultivation chiefly contribute to all of these characters. In proof of which we have the fact that the same trees which, when growing close together, are tall and slender, when grown farther apart become stouter and shorter; and if we from the first let the branches grow freely, the tree becomes short, whereas, if we prune them, it becomes tall,—for instance, the vine.

This too is enough for proof that even some pot-herbs acquire the form of a tree, as we said² of mallow and beet. Indeed all things grow well in congenial places. . . .³ For even among those of the same kind those which grow in congenial places have less knots, and are taller and more comely: thus the silver-fir in Macedon is superior to other silver-firs, such as that of Parnassus. Not only is this true of all these,⁴ but in general the wild woodland is more beautiful and vigorous on the north side of the mountain than on the south.

As to shedding of leaves.

Again some⁵ trees are evergreen, some deciduous. Of cultivated trees, olive date-palm bay myrtle a kind of fir and cypress are evergreen, and among wild trees silver-fir fir Phoenician cedar yew⁶ odorous cedar the tree which the Arcadians call 'cork-oak' (holm-oak) mock-privet prickly cedar 'wild'⁷ pine tamarisk box kermes-oak holly alaternus cotoneaster hybrid arbutus⁸ (all of which grow about Olympus)

⁷ ἀρπία after πίτυς conj. Sch.; after πῖπος UP Ald.: cf. 3. 3. 3.

⁸ κέδραρος conj. Bod.; σίναρος UMV; σίναρος Ald.; σύναρος P₂.

THEOPHRASTUS

ἀγρία δάφνη. δοκεῖ δὲ ή ἀνδράχλη καὶ ὁ κόμαρος τὰ μὲν κάτω φυλλοβολεῖν τὰ δὲ ἔσχατα τῶν ἀκρεμόνων ἀείφυλλα ἔχειν, ἐπιφύειν δὲ ἀεὶ τοὺς ἀκρεμόνας.

4 Τῶν μὲν οὖν δένδρων ταῦτα. τῶν δὲ θαμνώδῶν κιττὸς βάτος ράμνος κάλαμος κεδρίς· ἔστι γάρ τι μικρὸν δὲ οὐ δευδροῦται. τῶν δὲ φρυγανικῶν καὶ ποιωδῶν πήγανον ράφανος ροδωνία ἰωνία ἀβρότονον ἀμάρακον ἔρπυλλος ὄρίγανον σέλινον ἵπποσέλινον μήκων καὶ τῶν ἀγρίων εἴδη πλείω. διαμένει δὲ καὶ τούτων ἔνια τοῖς ἄκροις τὰ δὲ ἄλλα ἀποβάλλει οἷον ὄρίγανον σέλινον . . . ἐπεὶ καὶ τὸ πήγανον κακοῦται καὶ ἀλλάττεται.

5 Πάντα δὲ καὶ τῶν ἄλλων τὰ ἀείφυλλα στενοφυλλότερα καὶ ἔχοντά τινα λιπαρότητα καὶ εὐωδίαν. ἔνια δὲ οὐκ ὄντα τῇ φύσει παρὰ τὸν τόπον ἔστιν ἀείφυλλα, καθάπερ ἐλέχθη περὶ τῶν ἐν Ἐλεφαντίνῃ καὶ Μέμφει κατωτέρω δὲ ἐν τῷ Δέλτα μικρὸν πάνυ χρόνον διαλείπει τοῦ μὴ ἀεὶ βλαστάνειν. ἐν Κρήτῃ δὲ λέγεται πλάτανόν τινα εἶναι ἐν τῇ Γορτυναίᾳ πρὸς πηγὴν τινι ἥ οὐ φυλλοβολεῖν· μυθολογοῦσι δὲ ὡς ὑπὸ ταύτη ἐμίγη τῇ Εύρωπῃ ὁ Ζεύς· τὰς δὲ πλησίας πάσας φυλλοβολεῖν. ἐν δὲ Συβάρει δρῦς ἔστιν εὐσύνοπτος ἐκ τῆς πόλεως ἥ οὐ φυλλοβολεῖν· φασὶ

¹ Plin. 16. 80.

² Some words probably missing (W.) which would explain the next two clauses. ³ Plin. 16. 82. ⁴ 1. 3. 5.

⁵ Plin. 12. 11; Varro, 1. 7.

andrachne arbutus terebinth 'wild bay' (oleander). Andrachne and arbutus seem to cast their lower leaves, but to keep those at the end of the twigs perennially, and to be always adding leafy twigs. These are the trees which are evergreen.

¹ Of shrubby plants these are evergreen:—ivy bramble buckthorn reed *kedris* (juniper)—for there is a small kind of *kedros* so called which does not grow into a tree. Among under-shrubs and herbageous plants there are rue cabbage rose gilliflower southernwood sweet marjoram tufted thyme marjoram celery alexanders poppy, and a good many more kinds of wild plants. However some of these too, while evergreen as to their top growths, shed their other leaves, as marjoram and celery² for rue too is injuriously affected and changes its character.

³ And all the evergreen plants in the other classes too have narrower leaves and a certain glossiness and fragrance. Some moreover which are not evergreen by nature become so because of their position, as was said⁴ about the plants at Elephantine and Memphis, while lower down the Nile in the Delta there is but a very short period in which they are not making new leaves. It is said that in Crete⁵ in the district of Gortyna there is a plane near a certain spring⁶ which does not lose its leaves; (indeed the story is that it was under⁷ this tree that Zeus lay with Europa), while all the other plants in the neighbourhood shed their leaves. ⁸ At Sybaris there is an oak within sight of the city which does not shed

⁶ πηγῆ conj. H. from G; σκηνῆ UMVAld.; κηνῆ P₂; κρηνῆ mBas.

⁷ ὑπὸ conj. Hemsterhuis; ἐπὶ Ald.

⁸ Plin. 16. 81.

THEOPHRASTUS

δὲ οὐ βλαστάνειν αὐτὴν ἅμα ταῖς ἄλλαις ἀλλὰ μετὰ Κύνα. λέγεται δὲ καὶ ἐν Κύπρῳ πλάτανος εἶναι τοιαύτη.

6 Φυλλοβολεῖ δὲ πάντα τοῦ μετοπώρου καὶ μετὰ τὸ μετόπωρον, πλὴν τὸ μὲν θάττον τὸ δὲ βραδύτερον ὥστε καὶ τοῦ χειμῶνος ἐπιλαμβάνειν. οὐκ ἀνάλογοι δὲ αἱ φυλλοβολίαι ταῖς βλαστήσεσιν, ὥστε τὰ πρότερον βλαστήσαντα πρότερον φυλλοβολεῖν, ἀλλ' ἔνια πρωΐβλαστεῖ μὲν οὐδὲν δὲ προτερεῖ τῶν ἄλλων, ἀλλά τινων καὶ ὑστερεῖ, καθάπερ ἡ ἀμυγδαλῆ.

7 Τὰ δὲ ὄψιβλαστεῖ μὲν οὐδὲν δὲ ὡς εἰπεῖν ὑστερεῖ τῶν ἄλλων, ὥσπερ ἡ συκάμινος. δοκεῖ δὲ καὶ ἡ χώρα συμβάλλεσθαι καὶ ὁ τόπος ὁ ἔνικμος πρὸς τὸ διαμένειν. τὰ γὰρ ἐν τοῖς ξηροῖς καὶ ὅλως λεπτογείοις πρότερα φυλλοβολεῖ καὶ τὰ πρεσβύτερα δὲ τῶν νέων. ἔνια δὲ καὶ πρὸ τοῦ πεπάναι τὸν καρπὸν ἀποβάλλει τὰ φύλλα, καθύπερ αἱ ὄψιαι συκαῖ καὶ ἀχράδες.

Τῶν δὲ ἀειφύλλων ἡ ἀποβολὴ καὶ ἡ αὔανσις κατὰ μέρος· οὐ γὰρ δὴ ταῦτα αἱὲ διαμένει, ἀλλὰ τὰ μὲν ἐπιβλαστάκει τὰ δ' ἀφαναίνεται. τοῦτο δὲ περὶ τροπὰς μάλιστα γίνεται θερινάς. εἰ δέ τινων καὶ μετ' Ἀρκτοῦρον ἡ καὶ κατ' ἄλλην ὥραν ἐπισκεπτέον. καὶ τὰ μὲν περὶ τὴν φυλλοβολίαν οὕτως ἔχει.

¹ Plin. 16. 82 and 83.

ENQUIRY INTO PLANTS, I. ix. 5-7

its leaves, and they say that it does not come into leaf along with the others, but only after the rising of the dog-star. It is said that in Cyprus too there is a plane which has the same peculiarity.

¹ The fall of the leaves in all cases takes place in autumn or later, but it occurs later in some trees than in others, and even extends into the winter. However the fall of the leaf does not correspond to the growth of new leaves (in which case those that come into leaf earlier would lose their leaves earlier), but some (such as the almond) which are early in coming into leaf are not earlier than the rest in losing their leaves, but are even comparatively late.²

³ Others again, such as the mulberry, come into leaf late, but are hardly at all later than the others in shedding their leaves. It appears also that position and a moist situation conduce to keeping the leaves late; for those which grow in dry places, and in general where the soil is light, shed their leaves earlier, and the older trees earlier than young ones. Some even cast their leaves before the fruit is ripe, as the late kinds of fig and pear.

In those which are evergreen the shedding and withering of leaves take place by degrees; for it is not the same⁴ leaves which always persist, but fresh ones are growing while the old ones wither away. This happens chiefly about the summer solstice. Whether in some cases it occurs even after the rising of Arcturus or at a quite different season is matter for enquiry. So much for the shedding of leaves.

² ὑστερεῖ conj. H.; ὑστερον UMVP Ald.

³ Plin. 16. 84.

⁴ ταῦτα conj. Sch.; ταῦτα Ald.

THEOPHRASTUS

Χ. Τὰ δὲ φύλλα τῶν μὲν ἄλλων δένδρων ὅμοια πάντων αὐτὰ ἔαυτοῖς, τῆς δὲ λεύκης καὶ τοῦ κιττοῦ καὶ τοῦ καλουμένου κρότωνος ἀνόμοια καὶ ἔτεροσχήμονα· τὰ μὲν γὰρ νέα περιφερῆ τὰ δὲ παλαιότερα γωνοειδῆ, καὶ εἰς τοῦτο ἡ μετάστασις πάντων. τοῦ δὲ κιττοῦ ἀνάπαλιν νέου μὲν ὅντος ἐγγωνιώτερα πρεσβυτέρου δὲ περιφερέστερα· μεταβάλλει γὰρ καὶ οὗτος. ἵδιον δὲ καὶ τὸ τῇ ἐλάᾳ καὶ τῇ φιλύρᾳ καὶ τῇ πτελέᾳ καὶ τῇ λεύκῃ συμβαῖνον· στρέφειν γὰρ δοκοῦσιν τὰ ὑπτία μετὰ τροπὰς θερνάς, καὶ τούτῳ γνωρίζουσιν ὅτι γεγένηται τροπαῖ.

2 πάντα δὲ τὰ φύλλα διαφέρει κατὰ τὰ ὑπτία καὶ τὰ πρανῆ. καὶ τῶν μὲν ἄλλων τὰ ὑπτία ποιωδέστερα καὶ λειότερα· τὰς γὰρ ἵνας καὶ τὰς φλέβας ἐν τοῖς πρανέσιν ἔχουσιν, ὥσπερ ἡ χεὶρ *<τὰ ἄρθρα>*. τῆς δὲ ἐλάας λευκότερα καὶ ἡττον λεῖα ἐνίστε καὶ τὰ ὑπτία. πάντα δὴ ἡ τά γε πλεῖστα ἐκφανῆ ἔχει τὰ ὑπτία καὶ ταῦτα γίνεται τῷ ἡλίῳ φανερά. καὶ στρέφεται τὰ πολλὰ πρὸς τὸν ἡλιον· δι’ ὃ καὶ οὐ ῥάδιον εἰπεῖν ὁπότερον πρὸς τῷ κλῶνι μᾶλλον ἐστιν· ἡ μὲν γὰρ ὑπτιότης μᾶλλον δοκεῖ ποιεῖν τὸ πρανές, ἡ δὲ φύσις οὐχ ἡττον βούλεται τὸ ὑπτιον, ἄλλως τε καὶ ἡ ἀνάκλασις διὰ τὸν ἡλιον· ἵδοι δ’

¹ Plin. 16. 85.

² καὶ τοῦ κιττοῦ καὶ τοῦ MSS. cf. Plin. l.c.; Diosc. 4. 164. καὶ τοῦ κικλοῦ τοῦ καὶ conj. W.; Galen, *Lex. Hipp.*, gives κίκλιον as a name for the root of κρότων. cf. C.P. 2. 16. 4.

³ i.e. not 'entire.' 'Young leaves' = leaves of the young tree.

⁴ This seems to contradict what has just been said.

⁵ τὰ ἄρθρα add. Sch. from Plin. 16. 88, *incisuras*. cf. Arist. *H.A.* 1. 15, where Plin. (11. 274) renders ἄρθρα *incisuras*.

Differences in leaves.

X. ¹ Now, while the leaves of all other trees are all alike in each tree, those of the abele ivy ² and of the plant called *kroton* (castor-oil plant) are unlike one another and of different forms. The young leaves in these are round, the old ones angular,³ and eventually all the leaves assume that form. On the other hand⁴ in the ivy, when it is young, the leaves are somewhat angular, but when it is older, they become rounder: for in this plant too a change of form takes place. There is a peculiarity special to the olive lime elm and abele: their leaves appear to invert the upper surface after the summer solstice, and by this men know that the solstice is past. Now all leaves differ as to their upper and under surfaces; and in most trees the upper surfaces are greener and smoother, as they have the fibres and veins in the under surfaces, even as the human hand has its 'lines,'⁵ but even the upper surface of the leaf of the olive is sometimes whiter and less smooth.⁶ So all or most leaves display their upper surfaces, and it is these surfaces which are exposed to the light.⁷ Again most leaves turn towards the sun; wherefore also it is not easy to say which surface is next to the twig⁸; for, while the way in which the upper surface is presented seems rather to make the under surface closer to it, yet nature desires equally that the upper surface should be the nearer, and this is specially seen in the turning back⁹ of the leaf towards the sun. One

⁶ ἐντοτε καὶ τὰ ὄπτα conj. W.; λεῖα δὲ καὶ τὰ τοῦ κιττοῦ MSS. A makeshift correction of an obscure passage.

⁷ cf. Plin. l.c. ⁸ i.e. is the under one.

⁹ Whereby the under surface is exposed to it: see above.

THEOPHRASTUS

ἄν τις ὅσα πυκνὰ καὶ κατ' ἄλληλα, καθάπερ τὰ τῶν μυρρίνων.

3 Οἴονται δέ τινες καὶ τὴν τροφὴν τῷ ὑπτίῳ διὰ τοῦ πρανοῦς εἶναι, διὰ τὸ ἔνικμον ἀεὶ τοῦτο καὶ χνοῶδες εἶναι, οὐ καλῶς λέγοντες. ἀλλὰ τοῦτο μὲν ἵσως συμβαίνει χωρὶς τῆς ἴδιας φύσεως καὶ διὰ τὸ μὴ ὁμοίως ἡλιοῦσθαι, η δὲ τροφὴ διὰ τῶν φλεβῶν ἡ ἵνων ὁμοίως ἀμφοτέροις· ἐκ θατέρου δ' εἰς θάτερον οὐκ εὔλογον μὴ ἔχουσι πόρους μηδὲ βάθος δι' οὐ· ἀλλὰ περὶ μὲν τροφῆς διὰ τίνων ἔτερος λόγος.

4 Διαφέρουσι δὲ καὶ τὰ φύλλα πλείοσι διαφοραῖς· τὰ μὲν γάρ ἔστι πλατύφυλλα, καθάπερ ἀμπελος συκῆ πλάτανος, τὰ δὲ στενόφυλλα, καθάπερ ἐλάα ρόα μύρρινος· τὰ δ' ὀσπερ ἀκανθόφυλλα, καθάπερ πευκη πίτυς κέδρος· τὰ δ' οἷον σαρκόφυλλα· τοῦτο δ' ὅτι σαρκῶδες ἔχουσι τὸ φύλλον, οἷον κυπάριστος μυρίκη μηλέα, τῶν δὲ φρυγανικῶν κνέωρος στοιβὴ καὶ ποιωδῶν ἀείζων πόλιον· [τοῦτο δὲ καὶ πρὸς τοὺς σῆτας τοὺς ἐν τοῖς ἴματίοις ἀγαθόν·] τὰ γὰρ αὖ τῶν τευτλίων ἡ ράφανων ἄλλον τρόπον σαρκώδη καὶ τὰ τῶν πηγανίων καλουμένων· ἐν πλάτει γὰρ καὶ οὐκ ἐν στρογγυλότητι τὸ σαρκῶδες. καὶ τῶν θαμνωδῶν δὲ ἡ μυρίκη σαρκῶδες τὸ φύλλον ἔχει. ἔνια δὲ

¹ cf. 1. 8. 3 ; 1. 10. 8 ; Plin. 16. 92.

² ἐκ θατέρου δ' εἰς conj. Sch. from G ; δὲ ἐκ θατέρου εἰς with stop at *ινῶν* Ald.

³ δι' οὐ I conj.; δι' ὅν U.
⁴ ἀκανθόφυλλα conj. W. ; στανόφυλλα UMAld.; ἀνόφυλλα P₂; cf. 3. 9. 5, whence Sch. conj. τριχόφυλλα: Plin. l.c. has *capillata pino cedro*.

⁵ μηλέα probably corrupt; omitted by Plin. l.c.

ENQUIRY INTO PLANTS, I. x. 2-5

may observe this in trees whose leaves are crowded and opposite,¹ such as those of myrtle.

Some think that the nourishment too is conveyed to the upper surface through the under surface, because this surface always contains moisture and is downy, but they are mistaken. It may be that this is not due to the trees' special character, but to their not getting an equal amount of sunshine, though the nourishment conveyed through the veins or fibres is the same in both cases. That it should be conveyed from one side to the other² is improbable, when there are no passages for it nor thickness for it to pass through.³ However it belongs to another part of the enquiry to discuss the means by which nourishment is conveyed.

Again there are various other differences between leaves; some trees are broad-leaved, as vine fig and plane, some narrow-leaved, as olive pomegranate myrtle. Some have, as it were, spinous⁴ leaves, as fir Aleppo pine prickly cedar; some, as it were, fleshy leaves; and this is because their leaves are of fleshy substance, as cypress tamarisk apple,⁵ among under-shrubs *kneoros* and *stoibe*, and among herba-ceous plants house-leek and hulwort.⁶ This plant is good against moth in clothes. For the leaves of beet and cabbage are fleshy in another way, as are those of the various plants called rue; for their fleshy character is seen in the flat instead of in the round.⁷ Among shrubby plants the tamarisk⁸ has fleshy

⁶ Probably a gloss.

⁷ Or 'solid,' such leaves being regarded as having, so to speak, three, and not two dimensions. *στρόγγυλος* = 'thick-set' in Arist. *H.A.* 9. 44.

⁸ *μυρίκη* probably corrupt; *μ.* was mentioned just above, among *trees*; *ερείκη* conj. Dalec.

THEOPHRASTUS

καὶ καλαμόφυλλα, καθάπερ ὁ φοῖνιξ καὶ ὁ κόϊξ
 καὶ ὅσα τοιαῦτα· ταῦτα δὲ ὡς καθ' ὅλου εἴπειν
 γωνιόφυλλα· καὶ γὰρ ὁ κάλαμος καὶ ὁ κύπειρος
 καὶ ὁ βούτομος καὶ τάλλα δὲ τῶν λιμνωδῶν
 τοιαῦτα· πάντα δὲ ὥσπερ ἐκ δυοῦ σύνθετα καὶ
 τὸ μέσον οἰον τρόπις, οὐν ἐν τοῖς ἄλλοις μέγας
 πόρος ὁ μέσος. διαφέρουσι δὲ καὶ τοῖς σχήμασι·
 τὰ μὲν γὰρ περιφερῆ, καθάπερ τὰ τῆς ἀπίου, τὰ
 δὲ προμηκέστερα, καθάπερ τὰ τῆς μηλέας· τὰ δὲ
 εἰς ὁξὺ προήκοντα καὶ παρακανθίζοντα, καθάπερ
 τὰ τοῦ μίλακος. καὶ ταῦτα μὲν ἀσχιστα· <τὰ δὲ
 σχιστὰ> καὶ οἰον πριονώδη, καθάπερ τὰ τῆς
 ἐλάτης καὶ τὰ τῆς πτερίδος· τρόπον δέ τινα
 σχιστὰ καὶ τὰ τῆς ἀμπέλου, καὶ τὰ τῆς συκῆς
 δὲ ὥσπερ ἀν εἴποι τις κορωνοποδώδη. ἔνια δὲ
 καὶ ἐντομὰς ἔχοντα, καθάπερ τὰ τῆς πτελέας καὶ
 τὰ τῆς Ἡρακλεωτικῆς καὶ τὰ τῆς δρυός. τὰ δὲ
 καὶ παρακανθίζοντα καὶ ἐκ τοῦ ἄκρου καὶ ἐκ τῶν
 πλαγίων, οἰον τὰ τῆς πρίνου καὶ τὰ τῆς δρυὸς
 καὶ μίλακος καὶ βάτου καὶ παλιούρου καὶ τὰ τῶν
 ἄλλων. ἀκανθῶδες δὲ ἐκ τῶν ἄκρων καὶ τὸ τῆς
 πεύκης καὶ πίτυος καὶ ἐλάτης ἔτι δὲ κεδρού καὶ
 κεδρίδος. φυλλάκανθον δὲ ὅλως ἐν μὲν τοῖς
 δένδροις οὐκ ἔστιν οὐδὲν ὡν ἡμεῖς ἴσμεν, ἐν δὲ
 τοῖς ἄλλοις ὑλήμασίν ἔστιν, οἰον ἡ τε ἄκορνα καὶ
 ἡ δρυπὶς καὶ ὁ ἀκανος καὶ σχεδὸν ἄπαν τὸ τῶν
 ἀκανωδῶν γένος· ὥσπερ γὰρ φύλλον ἔστιν ἡ
 ἀκανθα πᾶσιν· εἰ δὲ μὴ φύλλα τις ταῦτα θήσει,

¹ Plin. *l.c.* and 13. 30. ² οὖν ἐν conj. W.; γθεν Ald. H.

³ παρακανθίζοντα conj. Sch.; παραγωνίζοντα UΜV Ald.

⁴ τὰ δὲ σχιστὰ add. W.

ENQUIRY INTO PLANTS, I. x. 5-6

leaves. Some again have reedy leaves, as date-palm doum-palm and such like. But, generally speaking, the leaves of these end in a point; for reeds galin-gale sedge and the leaves of other marsh plants are of this character.¹ The leaves of all these are compounded of two parts, and the middle is like a keel, placed where in² other leaves is a large passage dividing the two halves. Leaves differ also in their shapes; some are round, as those of pear, some rather oblong, as those of the apple; some come to a sharp point and have spinous projections³ at the side, as those of smilax. So far I have spoken of undivided leaves; but some are divided⁴ and like a saw, as those of silver-fir and of fern. To a certain extent those of the vine are also divided, while those of the fig one might compare to a crow's foot.⁵ ⁶ Some leaves again have notches, as those of elm filbert and oak, others have spinous projections both at the tip and at the edges, as those of kermes-oak oak smilax bramble Christ's thorn and others. The leaf of fir Aleppo pine silver-fir and also of prickly cedar and *kedris* (juniper)⁷ has a spinous point at the tip. Among other trees there is none that we know which has spines for leaves altogether, but it is so with other woody plants, as *akorna drypis* pine-thistle and almost all the plants which belong to that class.⁸ For in all these spines, as it were, take the place of leaves, and, if one is not to reckon these

⁵ κορωνοκοδάδη conj. Gesner. The fig-leaf is compared to a crow's foot, Plut. *de defect. orac.* 3; σκολοπάδη Ald., which word is applied to thorns by Diosc. ⁶ Plin. 16. 90.

⁷ κεδρίδος conj. Dalec.; κεδρίας MSS. cf. Plin. *l.c.*, who seems to have read ἄγριας.

⁸ ἀκανθώδων conj. W., cf. 1. 13. 3; ἀκανθωδῶν MSS.; ἀκανθῶν P₂.

THEOPHRASTUS

συμβαίνοι ἀν ὅλως ἄφυλλα εἶναι, ἐνίοις δὲ ἄκανθαν
μὲν εἶναι φύλλον δὲ ὅλως οὐκ ἔχειν, καθάπερ ὁ
ἀσφάραγος.

7 Πάλιν δ' ὅτι τὰ μὲν ἄμισχα, καθάπερ τὰ τῆς
σκίλλης καὶ τοῦ βολβοῦ, τὰ δ' ἔχοντα μίσχον.
καὶ τὰ μὲν μακρόν, οἷον ἡ ἀμπέλος καὶ ὁ κιττός,
τὰ δὲ βραχὺν καὶ οἷον ἐμπεφυκότα, καθάπερ ἐλάα
καὶ οὐχ ὥσπερ ἐπὶ τῆς πλατάνου καὶ ἀμπέλου
προσηρτημένον. διαφορὰ δὲ καὶ τὸ μὴ ἐκ τῶν
αὐτῶν εἶναι τὴν πρόσφυσιν, ἀλλὰ τοῖς μὲν
πλείστοις ἐκ τῶν κλάδων τοῖς δὲ καὶ ἐκ τῶν
ἀκρεμόνων, τῆς δρυὸς δὲ καὶ ἐκ τοῦ στελέχους,
τῶν δὲ λαχανωδῶν τοῖς πολλοῖς εὐθὺς ἐκ τῆς
ῥίζης, οἷον κρομύου σκόρδου κιχορίου, ἔτι δὲ
ἀσφοδέλου σκίλλης βολβοῦ σισυριγχίου καὶ
ὅλως τῶν βολβωδῶν· καὶ τούτων δὲ οὐχ ἡ πρώτη
μόνον ἔκφυσις ἀλλὰ καὶ δλος ὁ καυλὸς ἄφυλλον.
ἐνίων δ' ὅταν γένηται, φύλλα εἰκός, οἷον θριδακίνης
ώκιμου σελίνου καὶ τῶν σιτηρῶν ὁμοίως. ἔχει
δ' ἔνια τούτων καὶ τὸν καυλὸν εἰτ' ἄκανθίζοντα,
ώς ἡ θριδακίνη καὶ τὰ φυλλάκανθα πάντα καὶ
τῶν θαμνωδῶν δὲ καὶ ἔτι μᾶλλον, οἷον βάτος
παλίουρος.

8 Κοινὴ δὲ διαφορὰ πάντων ὁμοίως δένδρων καὶ
τῶν ἄλλων ὅτι τὰ μὲν πολύφυλλα τὰ δ' ὀλιγό-
φυλλα. ὡς δ' ἐπὶ τὸ πᾶν τὰ πλατύφυλλα ταξί-
φυλλα, καθάπερ μύρρινος, τὰ δὲ ἄτακτα καὶ ὡς
ἔτυχε, καθάπερ σχεδὸν τὰ πλεῖστα τῶν ἄλλων

¹ Plin. 16. 91.

² ἐπὶ conj. W.; ἡ Ald. H.

³ ἐνίων . . . εἰκός. So Sch. explains: text probably defective.

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as leaves, they would be entirely leafless, and some would have spines but no leaves at all, as asparagus.

¹ Again there is the difference that some leaves have no leaf-stalk, as those of squill and purse-tassels, while others have a leaf-stalk. And some of the latter have a long leaf-stalk, as vine and ivy, some, as olive, a short one which grows, as it were, into the stem and is not simply attached to it, as it is in ² plane and vine. Another difference is that the leaves do not in all cases grow from the same part, but, whereas in most trees they grow from the branches, in some they grow also from the twigs, and in the oak from the stem as well; in most pot-herbs they grow directly from the root, as in onion garlic chicory, and also in asphodel squill purse-tassels Barbary-nut, and generally in plants of the same class as purse-tassels; and in these not merely the original growth but the whole stalk is leafless. In some, when the stalk is produced, the leaves may be expected to grow,³ as in lettuce basil celery, and in like manner in cereals. In some of these the stalk presently becomes spinous, as in lettuce and the whole class of plants with spinous leaves, and still more in shrubby plants, as bramble and Christ's thorn.

⁴ Another difference which is found in all trees alike and in other plants as well is that some have many, some few leaves. And in general those that have flat leaves⁵ have them in a regular series, as myrtle, while in other instances the leaves are in no particular order, but set at random, as in most other

⁴ Plin. 16. 92.

⁵ πλατύφυλλα UVP; πολύφυλλα conj. W.; but πλατύτης is one of the 'differences' given in the summary below.

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[ἥν]. ἵδιον δὲ ἐπὶ τῶν λαχανωδῶν, οἷον κρομύου γητείου, τὸ κοιλόφυυλον.

‘Απλῶς δ’ αἱ διαφοραὶ τῶν φύλλων ἡ μεγέθει ἡ πλήθει ἡ σχήματι ἡ πλατύτητι ἡ στενότητι ἡ κοιλότητι ἡ τραχύτητι ἡ λειότητι καὶ τῷ παρακανθίζειν ἡ μή. ἔτι δὲ κατὰ τὴν πρόσφυσιν ὅθεν ἡ δι’ οὖν τὸ μὲν ὅθεν, ἀπὸ ρίζης ἡ κλάδου ἡ καυλοῦ ἡ ἀκρεμόνος τὸ δὲ δι’ οὖν, ἡ διὰ μίσχου ἡ δι’ αὐτοῦ καὶ εἰ δὴ πολλὰ ἐκ τοῦ αὐτοῦ. καὶ ἔνια καρποφόρα, μεταξὺ περιειληφότα τὸν καρπόν, ὥσπερ ἡ Ἀλεξανδρεία δάφνη ἐπιφυλλόκαρπος.

Αἱ μὲν οὖν διαφοραὶ τῶν φύλλων κοινοτέρως πᾶσαι εἴρηνται καὶ σχεδόν εἰσιν ἐν τούτοις.

(Σύγκειται δὲ τὰ μὲν ἔξι ἵνδος καὶ φλοιοῦ καὶ σαρκός, οἷον τὰ τῆς συκῆς καὶ τῆς ἀμπέλου, τὰ δὲ ὥσπερ ἔξι ἵνδος μόνον, οἷον τοῦ καλάμου καὶ σίτου.

⁹ τὸ δὲ ὑγρὸν ἀπάντων κοινόν¹ ἄπασι γὰρ ἐνυπάρχει καὶ τούτοις καὶ τοῖς ἄλλοις τοῖς ἐπετείοις [μίσχος ἄνθος καρπὸς εἴ τι ἄλλο]²· μᾶλλον δὲ καὶ τοῖς μὴ ἐπετείοις³ οὐδὲν γὰρ ἄνευ τούτου. δοκεῖ δὲ καὶ τῶν μίσχων τὰ μὲν ἔξι ἵνῶν μόνον συγκεισθαι, καθάπερ τὰ τοῦ σίτου καὶ τοῦ καλάμου, τὰ δὲ ἐκ τῶν αὐτῶν, ὥσπερ οἱ καυλοί.

¹ τῶν ἄλλων ἥν MSS.; τῶν ποιωδῶν conj. W. ἥν, at all events, cannot be right. ² Plin. 19. 100.

³ ἡ στενότητι ἡ κοιλότητι: so G.; ἡ κοιλότητι ἡ στενότητι MSS. ⁴ i.e. petiolate. ⁵ i.e. sessile.

⁶ i.e. compound: εἰ δὴ conj. W.; εἰδη UMVALd.

⁷ The passage from here to the end of the chapter is a digression.

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plants.¹ ² It is peculiar to pot-herbs to have hollow leaves, as in onion and horn-onion.

To sum up, the differences between leaves are shewn in size, number, shape, hollowness, in breadth,³ roughness and their opposites, and in the presence or absence of spinous projections; also as to their attachment, according to the part from which they spring or the means by which they are attached; the part from which they spring being the root or a branch or the stalk or a twig, while the means by which they are attached may be a leaf-stalk,⁴ or they may be attached directly;⁵ and there may be⁶ several leaves attached by the same leaf-stalk. Further some leaves are fruit-bearing, enclosing the fruit between them, as the Alexandrian laurel, which has its fruit attached to the leaves.

These are all the differences in leaves stated somewhat generally, and this is a fairly complete list of examples.

Composition of the various parts of a plant.

⁷ (Leaves are composed some of fibre bark and flesh, as those of the fig and vine, some, as it were, of fibre alone, as those of reeds and corn. But moisture is common to all, for it is found both in leaves and in the other annual parts,⁸ leaf-stalk, flower, fruit and so forth but more especially in the parts which are not annual⁹; in fact no part is without it. Again it appears that some leaf-stalks are composed only of fibre, as those of corn and reeds, some of the same materials as the stalks.

⁸ μίσχος . . . ἀλλο has no construction; probably a (correct) gloss, taken from 1, 2, 1.

⁹ i.e. while these are young, W.

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10 Τῶν δ' ἀνθῶν τὰ μὲν ἐκ φλοιοῦ καὶ φλεβὸς καὶ σαρκός, *<τὰ δ' ἐκ σαρκὸς>* μόνον, οἷον τὰ ἐν μέσῳ τῶν ἄρων.

Ομοίως δὲ καὶ ἐπὶ τῶν καρπῶν· οἱ μὲν γὰρ ἐκ σαρκὸς καὶ ἴνος, οἱ δὲ ἐκ σαρκὸς μόνον, οἱ δὲ καὶ ἐκ δέρματος σύγκεινται· τὸ δὲ ὑγρὸν ἀκολουθεῖ καὶ τούτοις. ἐκ σαρκὸς μὲν καὶ ἴνδος ὁ τῶν κοκκυμήλων καὶ σικύων, ἐξ ἴνδος δὲ καὶ δέρματος ὁ τῶν συκαμίνων καὶ τῆς ρόας. ἄλλοι δὲ κατ' ἄλλον τρόπον μεμερισμένοι. πάντων δὲ ὡς εἰπεῖν τὸ μὲν ἔξω φλοιὸς τὸ δ' ἐντὸς σάρξ τῶν δὲ καὶ πυρήν.)

XI. Ἐσχατον δ' ἐν ἄπασι τὸ σπέρμα. τοῦτο δὲ ἔχον ἐν ἑαυτῷ σύμφυτον ὑγρὸν καὶ θερμόν, ὃν ἐκλιπόντων ἄγονα, καθάπερ τὰ ὡά. καὶ τῶν μὲν εὐθὺς τὸ σπέρμα μετὰ τὸ περιέχον, οἷον φοίνικος καρύου ἀμυγδάλης, πλείω δὲ τούτων τὰ ἐμπεριέχοντα, ὡς τὰ τοῦ φοίνικος. τῶν δὲ μεταξὺ σάρξ καὶ πυρήν, ὥσπερ ἐλάας καὶ κοκκυμηλέας καὶ ἑτέρων. ἔνια δὲ καὶ ἐν λοβῷ, τὰ δ' ἐν ὑμένι, τὰ δ' ἐν ἀγγείῳ, τὰ δὲ καὶ γυμνόσπερμα τελείως.

2 Ἐν λοβῷ μὲν οὐ μόνον τὰ ἐπέτεια, καθάπερ τὰ χεδροπὰ καὶ ἔτερα πλείω τῶν ἀγρίων, ἀλλὰ καὶ τῶν δένδρων ἔνια, καθάπερ ἡ τε κερωνία, ἡν τινες καλούσι συκῆν Αἴγυπτίαν, καὶ ἡ κερκὶς καὶ ἡ κολοιτία περὶ Διπάραν· ἐν ὑμένι δ' ἔνια τῶν

¹ τὰ U; τὰ Ald.

² τὰ δ' ἐκ σαρκὸς preserved only in mBas.; om. UMVP₂.
Sch. reads τὰ.

³ ἄρων conj. W.; αἰρῶν MSS.

⁴ i.e. rind.

⁵ Plin. 18. 53.

⁶ οὐ conj. Sch.; οὐν Ald.H.

Of flowers some¹ are composed of bark veins and flesh, some of flesh only,² as those in the middle of cuckoo-pint.³

So too with fruits; some are made of flesh and fibre, some of flesh alone, and some of skin⁴ also. And moisture is necessarily found in these also. The fruit of plums and cucumbers is made of flesh and fibre, that of mulberries and pomegranates of fibre and skin. The materials are differently distributed in different fruits, but of nearly all the outside is bark, the inside flesh, and this in some cases includes a stone.)

Differences in seeds.

XI. Last in all plants comes the seed. This possesses in itself natural moisture and warmth, and, if these fail, the seeds are sterile, like eggs in the like case. In some plants the seed comes immediately inside the envelope, as in date filbert almond (however, as in the case of the date, there may be more than one covering). In some cases again there is flesh and a stone between the envelope and the seed, as in olive plum and other fruits. Some seeds again are enclosed in a pod, some in a husk, some in a vessel, and some are completely naked.

⁵ Enclosed in a pod are not⁶ only the seeds of annual plants, as leguminous plants, and of considerable numbers of wild plants, but also those of certain trees, as the carob-tree (which some⁷ call the 'Egyptian fig'), Judas-tree,⁸ and the *koloitia*⁹ of the Liparae islands. In a husk are enclosed the

⁷ οὐ τινες conj. St. from G; οὐτινα Ald.H.

⁸ Clearly not the *κερκις* (aspen) described 3. 14. 2.

⁹ κολοιτία MSS.; κολουτέα conj. St., cf. 3. 17. 2 n.

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ἐπετείων, ὥσπερ ὁ πυρὸς καὶ ὁ κέγχρος· ὡσαύτως δὲ καὶ ἐναγγειοσπέρματα καὶ γυμνοσπέρματα. ἐναγγειοσπέρματα μὲν οἷον ἡ τε μήκων καὶ ὅσα μηκωνικά· τὸ γὰρ σήσαμον ἴδιωτέρως· γυμνοσπέρματα δὲ τῶν τε λαχάνων πολλά, καθάπερ ἄνηθον κορίαννον ἄνησον κύμινον μάραθον καὶ 3 ἔτερα πλείω. τῶν δὲ δένδρων οὐδὲν γυμνόσπερμον ἀλλ’ ἡ σαρξὶ περιεχόμενον ἡ κελύφεσιν, τὰ μὲν δερματικοῖς, ὥσπερ ἡ βάλανος καὶ τὸ Εὐβοϊκόν, τὰ δὲ ἔντλαθεσιν, ὥσπερ ἡ ἀμυγδάλη καὶ τὸ κάρυον. οὐδὲν δὲ ἐναγγειόσπερμον, εἰ μή τις τὸν κῶνον ἀγγεῖον θήσει διὰ τὸ χωρίζεσθαι τῶν καρπῶν.

Αὐτὰ δὲ τὰ σπέρματα τῶν μὲν εὐθὺν σαρκώδη, καθάπερ ὅσα καρυηρὰ καὶ βαλανηρά· τῶν δὲ ἐν πυρῆνι τὸ σαρκώδες ἔχεται, καθάπερ ἐλάας καὶ δαφνίδος καὶ ἄλλων. τῶν δ’ ἐμπύρηνα μόνον ἡ πυρηνώδη γε καὶ ὥσπερ ξηρά, καθάπερ τὰ κυνηκώδη καὶ κεγχραμιδώδη καὶ πολλὰ τῶν λαχανηρῶν. ἐμφανέστατα δὲ τὰ τοῦ φοίνικος· οὐδὲ γὰρ κοιλότητα ἔχει τοῦτο οὐδεμίαν ἀλλ’ ὅλον ξηρόν· οὐ μὴν ἀλλ’ ὑγρότης δή τις καὶ θερμότης ὑπάρχει δῆλον δτι καὶ τούτῳ, καθάπερ εἴπομεν.

¹ μηκωνικὰ . . . τὸ γὰρ conj. W. from G; μήκωνι· κατὰ γὰρ UMAld.

² κορίαννον ἄνησον conj. Sch.; κοριάνησον UMAld.; κοράνησον V; cf. Plin. 19. 119.

³ ἡ κελύφεσιν conj. Sch., cf. C.P. 4. 1. 2; ἡ δὲ κύμασιν U; Plin. 15. 112, *crusta teguntur glandes.* ⁴ Plin. 15. 113.

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seeds of some annuals, as wheat and millet; and in like manner some plants have their seeds in a vessel, some have them naked. In a vessel are those of the poppy and plants of the poppy kind;¹ (the case of sesame however is somewhat peculiar), while many pot-herbs have their seeds naked, as dill coriander² anise cummin fennel and many others. No tree has naked seeds, but either they are enclosed in flesh or in shells,³ which are sometimes of leathery nature, as the acorn and the sweet chestnut, sometimes woody, as almond and nut. Moreover no tree has its seeds in a vessel, unless one reckons a cone as a vessel, because it can be separated from the fruits.

The actual seeds are in some cases fleshy in themselves, as all those which resemble nuts or acorns;⁴ in some cases the fleshy part is contained in a stone, as in olive bay and others. The seeds in some plants again merely consist of a stone,⁵ or at least are of stone-like character, and are, as it were,⁶ dry; for instance those of plants like safflower millet and many pot-herbs. Most obviously of this character are those of the date,⁷ for they contain no cavity, but are throughout dry⁸ ;—not but what there must be even in them some moisture and warmth, as we have said.⁹

⁵ ἐμπύρηνα μόνον ή πυρηνώδη conj. Sch.; ἐν πυρῆνι μόνον ή πυρηνώδει Ald. (P has πυρηνώδη).

⁶ i.e. no seed can really be without moisture; cf. 1. 11. 1.

⁷ cf. C.P. 5. 18. 4.

⁸ ξηρὸν I conj., as required by the next clause; ξυρθον PAld.; ξυρόν W. from Sch. conj. The germ in the date-stone is so small as to be undiscoverable, whence the stone seems to be homogeneous throughout, with no cavity for the germ.

⁹ 1. 10. 9.

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4 Διαφέρουσι δὲ καὶ τῷ τὰ μὲν ἀθρόα μετ' ἀλλήλων εἶναι, τὰ δὲ διεστῶτα καὶ στοιχηδόν, ὥσπερ τὰ τῆς κολοκύντης καὶ σικύας καὶ τῶν δένδρων, ὡς Περσικῆς μηλέας. καὶ τῶν ἀθρόων τὰ μὲν ἐνὶ τινι περιέχεσθαι, καθάπερ τὰ τῆς ῥόας καὶ τῆς ἀπίου καὶ μηλέας καὶ τῆς ἀμπέλου καὶ συκῆς· τὰ δὲ μετ' ἀλλήλων μὲν εἶναι, μὴ περιέχεσθαι δὲ ὑφ' ἐνός, ὥσπερ τὰ σταχυηρὰ τῶν ἐπετείων, εἰ μή τις θείη τὸν στάχυν ὡς περιέχον· οὕτω δὲ ἔσται καὶ ὁ βότρυς καὶ τάλλα τὰ βοτρυώδη καὶ ὅσα δὴ φέρει δι' εὐθοσίαν καὶ χώρας ἀρετὴν ἀθρόους τοὺς καρπούς, ὥσπερ ἐν Συρίᾳ φασὶ καὶ ἄλλοθι τὰς ἐλάσις.

5 Ἀλλὰ καὶ αὕτη δοκεῖ τις εἶναι διαφορὰ τὸ τὰ μὲν ἀφ' ἐνὸς μίσχου καὶ μιᾶς προσφύσεως ἀθρόα γίνεσθαι, καθάπερ ἐπί τε τῶν βοτρυηρῶν καὶ σταχυηρῶν εἴρηται μὴ περιεχόμενα κοινῷ τινι γίνεσθαι· τὰ δὲ μὴ γίνεσθαι. ἐπεὶ καθ' ἔκαστόν γε λαμβάνοντι τῶν σπερμάτων ἡ τῶν περιεχόντων ἴδιαν ἀρχὴν ἔχει τῆς προσφύσεως, οἷον ἡ τε ῥάξ καὶ ἡ ῥόα καὶ πάλιν ὁ πυρὸς καὶ ἡ κριθή. ἥκιστα δὲ ἀν δόξειεν τὰ τῶν μήλων καὶ τὰ τῶν ἀπίων, ὅτι συμφαύει τε καὶ περιείληπται καθάπερ ὑμένι τινὶ δερματικῷ περὶ δν τὸ περιέκάρπιον· ἀλλ' ὅμως καὶ τούτων ἔκαστον ἴδιαν ἀρχὴν ἔχει καὶ φύσιν· φανερώτατα δὲ τῷ

¹ στοιχηδόν conj. W.; σχεδὸν Ald.

² ἐνὶ τινι conj. Sch.; ἐν τινι Ald. ³ cf. Plin. 15. 15.

⁴ αὕτη conj. Sch.; αὐτὴ Ald.

⁵ τὸ conj. W.; τῷ Ald.

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Further seeds differ in that in some cases they are massed together, in others they are separated and arranged in rows,¹ as those of the gourd and bottle-gourd, and of some trees, such as the citron. Again of those that are massed together some differ in being contained in a single² case, as those of pomegranate pear apple vine and fig; others in being closely associated together, yet not contained in a single case, as, among annuals, those which are in an ear—unless one regards the ear as a case. In that case the grape-cluster and other clustering fruits will come under the description, as well as all those plants which on account of good feeding or excellence of soil bear their fruits massed together,³ as they say the olive does in Syria and elsewhere.

But this⁴ too seems to be a point of difference, that⁵ some grow massed together from a single stalk and a single attachment, as has been said in the case of plants with clusters or ears whose seeds do not grow contained in one common case; while others grow otherwise. For in these instances, if one takes each seed or case separately, it has its own special point of attachment, for instance each grape or pomegranate,⁶ or again each grain of wheat or barley. This would seem to be least of all the case with the seeds of apples and pears, since⁷ these touch one another⁸ and are enclosed in a sort of skin-like membrane, outside which is the fruit-case.⁹ However each of these too has its own peculiar point of attachment and character; this is most

⁶ οὐ τε . . . βόα.: text perhaps defective; οὐ τε βάξ βότρυνας καὶ τῆς βόας δὲ πυρῆν conj. Bod.

⁷ δύτι conj. Sch.; δύτι U; δύοι PMAld.

⁸ cf. 8. 5. 2. ⁹ i.e. pulp.

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κεχωρίσθαι τὰ τῆς ῥόας· ὁ γὰρ πυρὴν ἐκάστῳ προσπέφυκεν, οὐχ ὥσπερ τῶν συκῶν ἄδηλα διὰ τὴν ὑγρότητα. καὶ γὰρ τούτῳ ἔχουσι διαφορὰν καίπερ ἀμφότερα περιεχόμενα σαρκώδει τινὶ καὶ τῷ τοῦτο περιειληφότι μετὰ τῶν ἄλλων· τὰ μὲν γὰρ περὶ ἔκαστον ἔχει πυρῆνα τὸ σαρκώδεις τοῦτο τὸ ὑγρόν, αἱ δὲ κεγχραμίδες ὥσπερ κοινόν τι πᾶσαι, καθάπερ καὶ τὸ γίγαρτον καὶ ὅσα τὸν αὐτὸν ἔχει τρόπον. ἀλλὰ τὰς μὲν τοιαύτας διαφορὰς τάχ' ἄν τις λάβοι πλείους· ὡν δεῖ τὰς κυριωτάτας καὶ μάλιστα τῆς φύσεως μὴ ἀγνοεῖν.

XII. Αἱ δὲ κατὰ τοὺς χυλοὺς καὶ τὰ σχήματα καὶ τὰς ὅλας μορφὰς σχεδὸν φανεραὶ πᾶσιν, ὥστε μὴ δεῖσθαι λόγου· πλὴν τοσοῦτόν γ' ὅτι σχῆμα οὐδὲν περικάρπιον εὐθύγραμμον οὐδὲ γωνίας ἔχει. τῶν δὲ χυλῶν οἱ μέν εἰσιν οἰνώδεις, ὥσπερ ἀμπέλου συκαμίνου μύρτου· οἱ δ' ἐλαώδεις, ὥσπερ ἐλάσας δάφνης καρύας ἀμυγδαλῆς πεύκης πίτυος ἐλάτης· οἱ δὲ μελιτώδεις, οἰον σύκου φοίνικος διοσβαλάνου· οἱ δὲ δριμεῖς, οἰον ὄριγάνου θύμβρας καρδάμου νάπυος· οἱ δὲ πικροί, ὥσπερ ἀψινθίου κενταυρίου. διαφέρουσι δὲ καὶ ταῖς εὐωδίαις, οἰον ἀννήσου κεδρίδος· ἐνίων δὲ ὑδαρεῖς ἀν δόξαιεν, οἰον οἱ τῶν κοκκυμηλέων· οἱ δὲ ὀξεῖς, ὥσπερ ῥοῶν

¹ i.e. of the pulp. ² τούτῳ conj. Sch.; τοῦτο Ald.

³ τὸν om. St.: i.e. the seeds are arranged in compartments of the pulp.

obvious in the separation of the pomegranate seeds, for the stone is attached to each, and the connexion is not, as in figs, obscured by the moisture.¹ For here² too there is a difference, although in both cases the seeds are enclosed in a sort of fleshy substance, as well as in the case which encloses this and the other parts of the fruit. For in the pomegranate the stones have this moist fleshy substance enclosing each³ separate stone; but in the case of fig-seeds, as well as in that of grape-stones and other plants which have the same arrangement, the same pulp is common to all.⁴ However one might find more such differences, and one should not ignore the most important of them, namely those which specially belong to the plant's natural character.

Differences in taste.

XII. The differences in taste, shape, and form as a whole are tolerably evident to all, so that they do not need explanation; except that it should be stated that⁵ the case containing the fruit is never right-lined in shape and never has angles.⁶ Of tastes some are like wine, as those of vine mulberry and myrtle; some are like olive-oil, as, besides olive itself, bay hazel almond fir Aleppo pine silver-fir; some like honey, as fig date chestnut; some are pungent, as marjoram savory cress mustard; some are bitter, as wormwood centaury. Some also are remarkably fragrant, as anise and juniper⁷; of some the smell would seem to be insipid,⁸ as in plums; of others sharp, as in pomegranates and

¹ i.e. the fruit is not divided into compartments.

² πλήν η τοσοῦτον conj. W.; πλήν τοσοῦτον η UMAld.

³ Plin. 19. 186; 15. 109. ⁷ cf. 1. 9. 4. ⁸ Lit. watery.

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καὶ ἐνίων μῆλων. ἀπάντων δὲ οἰνώδεις καὶ τοὺς ἐν τούτῳ τῷ γένει θετέον· ἄλλοι δὲ ἐν ἄλλοις εἴδεσιν· ὑπὲρ ὧν ἀπάντων ἀκριβέστερον ἐν τοῖς περὶ χυλῶν ῥητέον, αὐτάς τε τὰς ἴδεας διαριθμουμένους ὀπόσαι καὶ τὰς πρὸς ἄλληλους διαφορὰς καὶ τίς ἡ ἐκάστου φύσις καὶ δύναμις.

2 Ἐχει δὲ καὶ ἡ τῶν δένδρων αὐτῶν ὑγρότης, ὡσπερ ἐλέχθη, διάφορα εἴδη· ἡ μὲν γάρ ἐστιν ὀπώδης, ὡσπερ ἡ τῆς συκῆς καὶ τῆς μήκωνος· ἡ δὲ πιττώδης, οἰον ἐλάτης πεύκης τῶν κωνοφόρων· ἄλλη δὲ ὑδαρής, οἰον ἀμπέλου ἀπίου μηλέας, καὶ τῶν λαχανωδῶν δέ, οἰον σικύου κολοκύντης θριδακίνης· αἱ δὲ [ἢδη] δριμύτητά τινα ἔχουσι, καθάπερ ἡ τοῦ θύμου καὶ θύμβρας· αἱ δὲ καὶ εὐωδίαν, ὡσπερ αἱ τοῦ σελίνου ἀνήθου μαράθου καὶ τῶν τοιούτων. ὡς δὲ ἀπλῶς εἰπεῖν ἅπασαι κατὰ τὴν ἴδιαν φύσιν ἐκάστου δένδρου καὶ ὡς καθ' ὅλου εἰπεῖν φυτοῦ· πᾶν γὰρ ἔχει κράσίν τινα καὶ μίξιν ἴδιαν, ἥπερ οἰκεία δῆλον ὅτι τυγχάνει τοῖς ὑποκειμένοις καρποῖς· ὧν τοῖς πλείστοις συνεμφαίνεται τις ὄμοιότης οὐκ ἀκριβής οὐδὲ σαφίς· ἀλλ' ἐν τοῖς περικαρπίοις· διὸ μᾶλλον κατεργασίαν λαμβάνει καὶ πέψιν καθαρὰν καὶ εἰλικρινῆ ἡ τοῦ

¹ cf. C.P. 6. 6. 4.

² T. is said to have written a treatise περὶ χυμῶν.

³ ὀπώδης. ὅπός is used specially of the juice of the fig itself.

⁴ μήκωνος probably corrupt: it should be a tree.

some kinds of apples.¹ But the smells even of those in this class must in all cases be called wine-like, though they differ in different kinds, on which matter we must speak more precisely, when we come to speak of flavours,² reckoning up the different kinds themselves, and stating what differences there are between them, and what is the natural character and property of each.

Now the sap of the trees themselves assumes different kinds of tastes as was said; sometimes it is milky,³ as that of the fig and poppy,⁴ sometimes like pitch, as in silver-fir fir and the conifers; sometimes it is insipid, as in vine pear and apple, as well as such pot-herbs as cucumber gourd lettuce; while others⁵ again have a certain pungency, such as the juice of thyme and savory; others have a fragrance, such as the juices of celery dill fennel and the like. To speak generally, all saps correspond to the special character of the several trees, one might almost add, to that of each plant. For every plant has a certain temperament and composition of its own, which⁶ plainly belongs in a special sense to the fruits of each. And in most of these is seen a sort of correspondence with the character of the plant as a whole, which is not however exact nor obvious; it is chiefly⁷ in the fruit-cases⁸ that it is seen, and that is why it is the character of the flavour which becomes more complete and matures into something separate and

¹ I have bracketed $\xi\delta\eta$: ? a dittography of $\alpha\iota\delta\epsilon$.

² $\xi\pi\epsilon\rho$ mBas. H; $\epsilon\pi\epsilon\rho$ M Ald.

³ $\alpha\lambda\lambda'\epsilon\nu\dots\mu\alpha\lambda\lambda\nu$ MSS. (?) Ald. H; $\gamma\alpha\rho$ for $\delta\alpha$ conj. W., omitting stop before it.

⁴ i.e. the pulp: so G, cf. 1, 11. 6.

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χυλοῦ φύσις· δεῖ γὰρ ὥσπερ τὸ μὲν ὕλην ὑπολαβεῖν τὸ δὲ εἶδος καὶ μορφήν.

3 Ἐχει δὲ αὐτὰ τὰ σπέρματα καὶ οἱ χιτῶνες οἱ περὶ αὐτὰ διαφορὰν τῶν χυλῶν. ὡς δ' ἀπλῶς εἰπεῖν ἄπαντα τὰ μόρια τῶν δένδρων καὶ φυτῶν, οἷον ρίζα καυλὸς ἀκρεμῶν φύλλον καρπός, ἔχει τινὰ οἰκειότητα πρὸς τὴν ὄλην φύσιν, εἰ καὶ παραλλάττει κατά τε τὰς δσμὰς καὶ τοὺς χυλούς, ὡς τὰ μὲν εὔοσμα καὶ εὐώδη τὰ δ' ἀσματικά καὶ ἄχυλα παντελῶς εἶναι τῶν τοῦ αὐτοῦ μορίων.

4 Ἐνίων γὰρ εὔοσμα τὰ ἄνθη μᾶλλον ἢ τὰ φύλλα, τῶν δὲ ἀνάπαλιν τὰ φύλλα μᾶλλον καὶ οἱ κλῶνες, ὥσπερ τῶν στεφανωματικῶν τῶν δὲ οἱ καρποί· τῶν δ' οὐδέτερον ἐνίων δ' αἱ ρίζαι· τῶν δέ τι μέρος. ὁμοίως δὲ καὶ κατὰ τοὺς χυλούς· τὰ μὲν γὰρ βρωτὰ τὰ δ' ἀβρωτα τυγχάνει καὶ ἐν φύλλοις καὶ περικαρπίοις. ἴδιωτατον δὲ τὸ ἐπὶ τῆς φιλύρας· ταύτης γὰρ τὰ μὲν φύλλα γλυκέα καὶ πολλὰ τῶν ζώων ἐσθίει, ὁ δὲ καρπὸς οὐδὲν βρωτός· ἐπεὶ τό γε ἀνάπαλιν οὐδὲν θαυμαστόν, ὥστε τὰ μὲν φύλλα μὴ ἐσθίεσθαι τοὺς δὲ καρποὺς οὐ μόνον ὑφ' ήμῶν ἀλλὰ καὶ ὑπὸ τῶν ἄλλων ζώων. ἀλλὰ καὶ περὶ τούτου καὶ τῶν ἄλλων τῶν τοιούτων ὕστερον πειρατέον θεωρεῖν τὰς αἰτίας.

XIII. Νῦν δὲ τοσοῦτον ἔστω δῆλον, ὅτι κατὰ πάντα τὰ μέρη πλείους εἰσὶ διαφορὰὶ πολλαχῶς.

¹ i.e. the pulp. ² i.e. the flavour.

³ Sense: Every tree has a characteristic juice of its own, which is however specially recognisable in its fruit; in the tree as a whole its character is not always apparent. Hence the importance of the flavour (which is seen in the fruit-pulp), since it is this which determines the specific character,

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distinct; in fact we must consider the one¹ as 'matter,' the other² as 'form' or specific character.³

Again the seeds themselves and the coats containing them have different flavours. And, to speak generally, all parts of trees and plants, as root stem branch leaf fruit, have a certain relationship to the character of the whole, even if⁴ there is variation in scents and tastes, so that of the parts of the same plant some are fragrant and sweet to the taste, while others are entirely scentless and tasteless.

For in some plants the flowers are more fragrant than the leaves, in others on the contrary it is rather the leaves and twigs which are fragrant, as in those used for garlands. In others again it is the fruits; in others it is neither⁵ of these parts, but, in some few cases, the root or some part of it. And so too with the flavours. Some leaves and some fruit-pulps are, and some are not good for food.
⁶ Most peculiar is the case of the lime: the leaves of this are sweet, and many animals eat them, but the fruit no creature eats, (for, as to the contrary case, it would not be at all surprising that the leaves should not be eaten, while the fruits were eaten not only by us but by other animals). But concerning this and other such matters we must endeavour to consider the causes on some other occasion.

Differences in flowers.

XIII. For the present let so much be clear, that in all the parts of plants there are numerous differ-

the pulp of fruit in general being, in Aristotelian language, the 'matter,' while the flavour is 'form.' cf. C.P. 6. 6. 6.

⁴ εἰ καὶ conj. Sch.; η δὲ U; εἰ δὲ MVAld.

⁵ οὐδέτερον seems inaccurately used, as four parts have been mentioned. ⁶ cf. 3. 10. 5; Plin 16. 65.

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έπει καὶ τῶν ἀνθῶν τὰ μέν ἔστι χνοώδη, καθάπερ τὸ τῆς ἀμπέλου καὶ συκαμίνου καὶ τοῦ κιττοῦ· τὰ δὲ φυλλώδη, καθάπερ ἀμυγδαλῆς μηλέας ἀπίου κοκκυμηλέας. καὶ τὰ μὲν μέγεθος ἔχει, τὸ δὲ τῆς ἐλάας φυλλώδες ὃν ἀμέγεθες. ὁμοιῶς δὲ καὶ ἐν τοῖς ἐπετείοις καὶ ποιώδεσι τὰ μὲν φυλλώδη τὰ δὲ χνοώδη. πάντων δὲ τὰ μὲν δίχροα τὰ δὲ μονόχροα. τὰ μὲν τῶν δένδρων τά γε πολλὰ μονόχροα καὶ λευκανθῆ¹ μόνον γὰρ ὡς εἰπεῖν τὸ τῆς ρόας φοινικοῦν καὶ ἀμυγδαλῶν τινῶν ὑπέρυθρον² ἄλλου δὲ οὐδενὸς τῶν ἡμέρων οὔτε ἀνθῶδες οὔτε δίχρουν, ἀλλ' εἴ τινος τῶν ἀγρίων, οἷον τὸ τῆς ἐλάτης³ κρόκινον γὰρ τὸ ταύτης ἄνθος⁴ καὶ ὅσα δή φασιν ἐν τῇ ἔξω θαλάττῃ ρόδων ἔχειν τὴν χρόαν.

2 Ἐν δὲ τοῖς ἐπετείοις σχεδὸν τά γε πλείω τοιαῦτα καὶ δίχροα καὶ διανθῆ. λέγω δὲ διανθὲς ὅτι ἔτερον ἄνθος ἐν τῷ ἄνθει ἔχει κατὰ μέσον, ὥσπερ τὸ ρόδον καὶ τὸ κρίνον καὶ τὸ ἴον τὸ μέλαν. ἔνια δὲ καὶ μονόφυλλα φύεται διαγραφὴν ἔχοντα μόνον τῶν πλειόνων, ὥσπερ τὸ τῆς ἰασιώνης⁵ οὐ γὰρ κεχώρισται ταύτης ἐν τῷ ἄνθει τὸ φύλλον ἔκαστον⁶ οὐδὲ δὴ τοῦ λειρίου τὸ κάτω μέρος, ἀλλὰ ἐκ τῶν ἄκρων ἀποφύσεις γωνιώδεις. σχεδὸν δὲ καὶ τὸ τῆς ἐλάας τοιοῦτόν ἔστιν.

3 Διαφέρει δὲ καὶ κατὰ τὴν ἔκφυσιν καὶ θέσιν· τὰ μὲν γὰρ ἔχει περὶ αὐτὸν τὸν καρπόν, οἷον ἀμ-

¹ i.e. petaloid.

² ἀγρίων Ald.; αἰτίων U; ἀντιῶν MV; ποντίων conj. W.

³ i.e. corolla and stamens, etc.

⁴ i.e. are gamopetalous (or gamosepalous).

ences shewn in a variety of ways. Thus of flowers some are downy, as that of the vine mulberry and ivy, some are 'leafy,'¹ as in almond apple pear plum. Again some of these flowers are conspicuous, while that of the olive, though it is 'leafy,' is inconspicuous. Again it is in annual and herbaceous plants alike that we find some leafy, some downy. All plants again have flowers either of two colours or of one; most of the flowers of trees are of one colour and white, that of the pomegranate being almost the only one which is red, while that of some almonds is reddish. The flower of no other cultivated trees is gay nor of two colours, though it may be so with some uncultivated² trees, as with the flower of silver-fir, for its flower is of saffron colour; and so with the flowers of those trees by the ocean which have, they say, the colour of roses.

However, among annuals, most are of this character—their flowers are two-coloured and twofold.³ I mean by 'twofold' that the plant has another flower inside the flower, in the middle, as with rose lily violet. Some flowers again consist of a single 'leaf,'⁴ having merely an indication of more, as that of bindweed.⁵ For in the flower of this the separate 'leaves' are not distinct; nor is it so in the lower part of the narcissus,⁶ but there are angular projections⁷ from the edges. And the flower of the olive is nearly of the same character.

But there are also differences in the way of growth and the position of the flower; some plants have it

⁵ cf. C.P. 2. 18. 2 and 3; Plin. 21. 65.

⁶ $\lambda\epsilon\pi\lambda\omega$ conj. Sch., i.e. narcissus, cf. 6. 6. 9; $\chi\epsilon\pi\lambda\omega$ MSS.

⁷ i.e. something resembling separate 'leaves' (petals or sepals).

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πελος ἐλάα· ἡς καὶ ἀποπίπτοντα διατετρημένα φαίνεται, καὶ τοῦτο σημεῖον λαμβάνουσιν εἰ καλῶς ἀπήνθηκεν ἐὰν γὰρ συγκαυθῆ ἢ βρεχθῆ, συναποβάλλει τὸν καρπὸν καὶ οὐ τετρημένου γίγνεται· σχεδὸν δὲ καὶ τὰ πολλὰ τῶν <ἀνθῶν> ἐν μέσῳ τὸ περικάρπιον ἔχει, τάχα δὲ καὶ ἐπ’ αὐτοῦ τοῦ περικαρπίου, καθάπερ ῥόα μελέα ἄπιος κοκκυμηλεα μύρρινος, καὶ τῶν γε φρυγανικῶν ῥόδωνία καὶ τὰ πολλὰ τῶν στεφανωτικῶν· κάτω γὰρ ὑπὸ τὸ ἄνθος ἔχει τὰ σπέρματα· φανερώτατον δὲ ἐπὶ τοῦ ῥόδου διὰ τὸν δύκον. ἔνια δὲ καὶ ἐπ’ αὐτῶν τῶν σπερμάτων, ὥσπερ ὁ ἄκανος καὶ ὁ κυνῆκος καὶ πάντα τὰ ἀκανώδη· καθ’ ἔκαστον γὰρ ἔχει τὸ ἄνθος. ὁμοίως δὲ καὶ τῶν ποιωδῶν ἔνια, καθάπερ τὸ ἄνθεμον· ἐν δὲ τοῖς λαχανηροῖς ὅ τε σίκυος καὶ ἡ κολοκύντη καὶ ἡ σικύα· πάντα γὰρ ἐπὶ τῶν καρπῶν ἔχει καὶ προσανξανομένων ἐπιμένει τὰ ἄνθη πολὺν χρόνον.

⁴ Ἀλλα δὲ ἴδιωτέρως, οἷον ὁ κιττὸς καὶ ἡ συκάμινος· ἐν αὐτοῖς μὲν γὰρ ἔχει τοῖς ὅλοις περικαρπίοις, οὐ μὴν οὕτε ἐπ’ ἄκροις οὕτ’ ἐπὶ περιειληφόσι καθ’ ἔκαστον, ἀλλ’ ἐν τοῖς ἀνὰ μέσον· εἰ μὴ ἄρα οὐ σύνδηλα διὰ τὸ χνοῶδες.

Ἐστι δὲ καὶ ἄγονα τῶν ἄνθων ἔνια, καθάπερ ἐπὶ τῶν σικύων ἀ ἐκ τῶν ἄκρων φύεται τοῦ κλή-

¹ cf. 3. 16. 4. ² Lacuna in text; ἄνθων I conj.

³ τάχα Ald.; τινα W. after Sch. conj.

⁴ ἄπιος conj. Bod.; ἄγνος Ald. H.

⁵ i. e. composites.

⁶ σπερμάτων conj. Dalec. from G; στομάτων Ald.

⁷ ἄκανος conj. W.; ἄκαρος UV.

⁸ ἀκανώδη conj. W.; ἄνθωδη Ald. H. cf. 1. 10. 6; 6. 4. 4.

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close above the fruit, as vine and olive; in the latter, when the flowers drop off, they are seen to have a hole through them,¹ and this men take for a sign whether the tree has blossomed well; for if the flower is burnt up or sodden, it sheds the fruit along with itself, and so there is no hole through it. The majority of flowers² have the fruit-case in the middle of them, or, it may be,³ the flower is on the top of the fruit-case, as in pomegranate apple pear⁴ plum and myrtle, and among under-shrubs, in the rose and in many of the coronary plants. For these have their seeds below, beneath the flower, and this is most obvious in the rose because of the size of the seed-vessel. In some cases⁵ again the flower is on top of the actual seeds,⁶ as in pine-thistle⁷ safflower and all thistle-like⁸ plants; for these have a flower attached to each seed. So too with some herbaceous plants, as *anthemon*, and among pot-herbs, with cucumber⁹ gourd and bottle-gourd; all these have their flowers attached on top of the fruits,¹⁰ and the flowers persist for a long time while the fruits are developing.

In some other plants the attachment is peculiar, as in ivy and mulberry; in these the flower is closely attached to the whole¹¹ fruit-case; it is not however set above it, nor in a seed-vessel that envelops each¹² separately, but it occurs in the middle part of the structure—except that in some cases it is not easily recognised because it is downy.

¹³ Again some flowers are sterile, as in cucumbers those which grow at the ends of the shoot, and that

⁹ ὅ τε σίκνος conj. W.; ὅπερ σίκνος UM; ὅ περσίκνος Ald.

¹⁰ καρπῶν conj. Sch.; ἄκρων Ald. H.

¹¹ i.e. compound. ¹² οὗτ' ἐπὶ I conj. for οὗτε.

¹³ cf. Arist. *Probl.* 20. 3.

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ματος, δι' δ καὶ ἀφαιροῦσιν αὐτά· κωλύει γὰρ τὴν τοῦ σικύου βλάστησιν. φασὶ δὲ καὶ τῆς μηλέας τῆς Μηδικῆς ὅσα μὲν ἔχει τῶν ἀνθῶν ὥσπερ ἥλακάτην τινὰ πεφυκυῖαν ἐκ μέσου ταῦτ' εἰναι γόνιμα, ὅσα δὲ μὴ ἔχει ταῦτ' ἄγονα. εἰ δὲ καὶ ἐπ' ἄλλου τινὸς ταῦτα συμβαίνει τῶν ἀνθοφόρων ὥστε ἄγονον ἄνθος φύειν εἴτε κεχωρισμένον εἴτε μή, σκεπτέον. ἐπεὶ γένη γε ἔνια καὶ ἀμπέλου καὶ ρόας ἀδυνατεῖ τελεοκαρπεῖν, ἀλλὰ μέχρι τοῦ ἄνθους ἡ γένεσις.

5 (Γίνεται δὲ καὶ τό γε τῆς ρόας ἄνθος πολὺ καὶ πυκνὸν καὶ δλως ὁ ὅγκος πλατὺς ὥσπερ ὁ τῶν ρόδων· κάτωθεν δὲ ἔτεροῖς· οἷος δίωτος μικρὸς ὥσπερ ἐκτετραμμένος ὁ κύτινος ἔχων τὰ χείλη μυχώδη.)

Φασὶ δέ τινες καὶ τῶν ὁμογενῶν τὰ μὲν ἀνθεῖν τὰ δὲ οὐ, καθάπερ τῶν φοινίκων τὸν μὲν ἄρρενα ἀνθεῖν τὸν δὲ θῆλυν οὐκ ἀνθεῖν ἀλλ' εὐθὺν προφαίνειν τὸν καρπόν.

Τὰ μὲν οὖν τῷ γένει ταῦτα τοιαύτην τὴν δια-

¹ i.e. the pistil.

² i.e. as seen from above: καὶ δλων . . . ρόδων describes the corolla, κάτωθεν . . . μυχώδη the undeveloped ovary, including the adherent calyx.

³ ρόδων conj. Bod.; δοῶν Ald.

⁴ κάτωθεν . . . μυχώδη I conj.; δ' ἔτεροι δι' ὃν ὡς μικρὸν ὥσπερ ἐκτετραμμένος κότινος ἔχων τὰ χείλη μυχώδη UMVAld. (except that Ald. has ἄγω for χείλη and ἐκτετραμμένος: so also P, but ἐκτετραμμένος). The sentence explains incidentally why the pomegranate flower was called κύτινος (cf. 2. 6. 12; C. P. 1. 14. 4; 2. 9. 3; 2. 9. 9; Diosc. 1. 110; Plin. 23. 110

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is why men pluck them off, for they hinder the growth of the cucumber. And they say that in the citron those flowers which have a kind of distaff¹ growing in the middle are fruitful, but those that have it not are sterile. And we must consider whether it occurs also in any other flowering plants that they produce sterile flowers, whether apart from the fertile flowers or not. For some kinds of vine and pomegranate certainly are unable to mature their fruit, and do not produce anything beyond the flower.

(The flower of the pomegranate is produced abundantly and is solid²: in general appearance it is a substantial structure with a flat top, like the flower of the rose³; but,⁴ as seen from below, the inferior part of the flower is different-looking, being like a little two-eared jar turned on one side and having its rim indented.)

Some say that even of plants of the same kind⁵ some specimens flower while others do not; for instance that the 'male' date-palm flowers but the 'female' does not, but exhibits its fruit without any antecedent flower.

Such⁶ is the difference which we find between and 111), i.e. because it resembled a *κύτος* (see LS. s.v.). T. chooses the particular form of jar called *δίωτος*, because the indentations between the sepals suggest this: . This is called *έκτετραμμένος*, because the weight of the developing fruit causes it to take up at one stage a horizontal position, like a jar lying on its side; *χείλη* refers to the jar (for the plural cf. the use of *ἄντυγες*), *μυχώδη* to the indentations in the calyx (a jar having ordinarily an unindented rim).

⁵ δμογγενῶν conj. Sch.; δμοιογγενῶν Ald.

⁶ ταῦτα τοιαύτην I conj. from G; τοιαῦτα τὴν UM; τοιαύτην P.

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φορὰν ἔχει, καθάπερ ὅλως ὅσα μὴ δύναται τελεοκαρπεῖν. ἡ δὲ τοῦ ἄνθους φύσις ὅτι πλείους ἔχει διαφορὰς φανερὸν ἐκ τῶν προειρημένων.

XIV. Διαφέρει δὲ τὰ δένδρα καὶ τοῖς τοιούτοις κατὰ τὴν καρποτοκίαν· τὰ μὲν γὰρ ἐκ τῶν νέων βλαστῶν φέρει τὰ δ' ἐκ τῶν ἔνων τὰ δ' ἐξ ἀμφοτέρων. ἐκ μὲν τῶν νέων συκῆ ἀμπελος· ἐκ δὲ τῶν ἔνων ἐλάα ρόα μηλέα ἀμυγδαλῆ ἀπιος μύρρινος καὶ σχεδὸν τὰ τοιαῦτα πάντα· ἐκ δὲ τῶν νέων ἐὰν ἄρα τι συμβῇ κυνῆσαι καὶ ἀνθῆσαι (γίνεται γὰρ καὶ ταῦτ' ἐνίοις, ὥσπερ καὶ τῷ μυρρίνῳ καὶ μάλισθ' ὡς εἰπεῖν περὶ τὰς βλαστήσεις τὰς μετ' Ἀρκτοῦρον) οὐδέναται τελεοῦν ἀλλ' ἡμιγενῆ φθείρεται· ἐξ ἀμφοτέρων δὲ καὶ τῶν ἔνων καὶ τῶν νέων εἴ τινες ἄρα μηλέαι τῶν διφόρων ἡ εἴ τι ἄλλο κάρπιμον· ἔτι δὲ ὁ ὅλυνθος ἐκπέττων καὶ σῦκα φέρων ἐκ τῶν νέων.

² Ιδιωτάτη δὲ ἡ ἐκ τοῦ στελέχους ἔκφυσις, ὥσπερ τῆς ἐν Αἰγύπτῳ συκαμίνου· ταύτην γάρ φασι φέρειν ἐκ τοῦ στελέχους· οἱ δὲ ταύτη τε καὶ ἐκ τῶν ἀκρεμόνων, ὥσπερ τὴν κερωνίαν· αὕτη γάρ καὶ ἐκ τούτων φέρει πλὴν οὐ πολύν· καλοῦσι δὲ κερωνίαν ἀφ' ἡς τὰ σῦκα τὰ Αἰγύπτια καλούμενα.

¹ ? i.e. that, like the 'female' date-palm, they have no flower.

² τοιαῦτα πάντα· ἐκ δὲ τῶν νέων ἐὰν ἄρα τι conj. W. ; τοιαῦτα πάντα γάρ ἐκ τῶν ἔνων· ἐὰν δὲ ἄρα τι MSS.

³ cf. 3. 5. 4.

⁴ διφόρων conj. Sch. from G ; διαφόρων U Ald.

ENQUIRY INTO PLANTS, I. xiii. 5-xiv. 2

plants of the same kind ; and the like may be said¹ in general of those which cannot mature their fruit. And it is plain from what has been said that flowers shew many differences of character.

Differences in fruits.

XIV. Again as to the production of fruit trees differ in the following respects. Some bear on their new shoots, some on last year's wood, some on both. Fig and vine bear on their new shoots ; on last year's wood olive pomegranate apple almond pear myrtle and almost all such trees. And, if any of these does² happen to conceive and to produce flowers on its new shoots, (for this does occur in some cases, as with myrtle, and especially, one may say, in the growth which is made after the rising of Arcturus)³ it can not bring them to perfection, but they perish half-formed. Some apples again of the twice-bearing⁴ kinds and certain other fruit-trees bear both on last year's wood and on the new shoots ; and so does the *olynthos*,⁵ which ripens its fruit as well as bearing figs on the new shoots.

Most peculiar is the growth of fruit direct from the stem, as in the sycamore ; for this, they say, bears fruit on the stem. Others say that it bears both in this way and⁶ also on the branches, like the carob ; for the latter bears on the branches too, though not abundantly : (the name carob is given to the tree which produces what are called 'Egyptian

¹ ὅλυνθος is not elsewhere used for a kind of fig : ἔτι δὲ συκῆ τοὺς ὅλύνθους ἐκπέττουσα καὶ σύκα φέρουσα conj. Sch. somewhat drastically.

² ταῦτη τε καὶ ἐκ conj. W. ; ταῦτης μὲν ἐκ UMVAld. cf. 4. 2. 4.

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ἔστι δὲ καὶ τὰ μὲν ἀκρόκαρπα τῶν δένδρων καὶ
ὅλως τῶν φυτῶν τὰ δὲ πλαγιόκαρπα τὰ δ' ἀμφο-
τέρως. πλείω δ' ἀκρόκαρπα τῶν ἄλλων ἢ τῶν
δένδρων, οἷον τῶν τε σιτηρῶν τὰ σταχυώδη καὶ
τῶν θαμνωδῶν ἐρείκη καὶ σπειραία καὶ ἄγνος καὶ
ἄλλ' ἄττα καὶ τῶν λαχανωδῶν τὰ κεφαλόρριζα.
ἐξ ἀμφοτέρων δὲ καὶ τῶν δένδρων ἔνια καὶ τῶν
λαχανωδῶν, οἷον βλίτον ἀδράφαξις ράφανος·
ἐπεὶ καὶ ἐλάα ποιεῖ πως τοῦτο, καὶ φασιν ὅταν
ἀκρον ἐνέγκη σημεῖον εὐφορίας εἶναι. ἀκρό-
καρπος δέ πως καὶ ὁ φοῖνιξ· πλὴν τοῦτο γε καὶ
ἀκρόφυλλον καὶ ἀκρόβλαστον· δόλως γὰρ ἐν τῷ
ἄνω πάν τὸ ζωτικόν. τὰς μὲν οὖν κατὰ <τὰ>
μέρη διαφορὰς πειρατέον ἐκ τούτων θεωρεῖν.

³ Αἱ δὲ τοιαῦται τῆς δόλης οὐσίας φαίνονται· δῆλον
ὅτι τὰ μὲν ἥμερα τὰ δ' ἄγρια· καὶ τὰ μὲν κάρπιμα
τὰ δ' ἄκαρπα· καὶ ἀείφυλλα καὶ φυλλοβόλα,
καθάπερ ἐλέχθη, τὰ δ' δόλως ἄφυλλα· καὶ τὰ μὲν
ἀνθητικὰ τὰ δ' ἀνανθῆ· καὶ πρωιβλαστῆ δὲ καὶ
πρωίκαρπα τὰ δὲ ὄφιβλαστῆ καὶ ὄφίκαρπα·
ώσαύτως δὲ καὶ ὅσα παραπλήσια τούτοις. καὶ
πως τά γε τοιαῦτα ἐν τοῖς μέρεσιν ἢ οὐκ ἄνευ τῶν
μερῶν ἔστιν. ἀλλ' ἐκείνη ἴδιωτάτη καὶ τροπόν τινα
μεγίστη διάστασις, ἥπερ καὶ ἐπὶ τῶν ζώων, ὅτι τὰ
μὲν ἔνυδρα τὰ δὲ χερσαῖα· καὶ γὰρ τῶν φυτῶν

¹ Plin. 16. 112.

² τοῦτο conj. Sch.; τούτου U Ald.; τοῦτον M.

³ τὰ add. W.; cf. 1. 13. 1.

figs').¹ Again some trees, and some plants in general, produce fruit at the top, others at the sides, others in both ways. But bearing fruit at the top is less common in trees than in other plants, as among grains in those which have an ear, among shrubby plants in heath privet chaste tree and certain others, and among pot-herbs in those with a bulbous root. Among plants which bear both on the top and at the sides are certain trees and certain pot-herbs, as blite orach cabbage. I say trees, since the olive does this too in a way, and they say that, when it bears at the top, it is a sign of fruitfulness. The date-palm too bears at the top, in a sense, but this² tree also has its leaves and shoots at the top; indeed it is in the top that its whole activity is seen. Thus we must endeavour to study in the light of the instances mentioned the differences seen in the³ various parts of the plant.

General differences (affecting the whole plant).

But there appear to be the following differences which affect the plant's whole being: some are cultivated, some wild; some fruitful, some barren; some evergreen, some deciduous, as was said, while some again have no leaves at all; some are flowering plants, some flowerless; some are early, some late in producing their shoots and fruits; and there are other differences similar to these. Now it may be said that⁴ such differences are seen in the parts, or at least that particular parts are concerned in them. But the special, and in a way the most important distinction is one which may be seen in animals too, namely, that some are of the water, some of the land. For

¹ καὶ πῶς τὰ γέ τοιαῦτα conj. Sch.; καὶ πῶν τὰ γέ ταῦτα U; καὶ τὰ γέ τοιαῦτα Ald.

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4 **ἔστι τι τοιοῦτον γένος δὲ οὐ δύναται φύεσθαι <μὴ>**
ἐν ὑγρῷ· τὰ δὲ φύεται μέν, οὐχ ὅμοια δὲ ἀλλὰ
χείρω. πάντων δὲ τῶν δένδρων ὡς ἀπλῶς εἰπεῖν
καὶ τῶν φυτῶν εἴδη πλείω τυγχάνει καθ' ἔκαστον
γένος· σχεδὸν γὰρ οὐδέν ἔστιν ἀπλοῦν· ἀλλ' ὅσα
μὲν ἥμερα καὶ ἄγρια λέγεται ταύτην ἐμφανε-
στάτην καὶ μεγίστην ἔχει διαφοράν, οἷον συκῆ
ἐρινεός, ἐλάα κότινος, ἄπιος ἀχράς· ὅσα δ' ἐν
ἔκατέρῳ τούτων τοῖς καρποῖς τε καὶ φύλλοις καὶ
ταῖς ἄλλαις μορφαῖς τε καὶ τοῖς μορίοις. ἀλλὰ
τῶν μὲν ἀγρίων ἀνώνυμα τὰ πλεῖστα καὶ ἔμπειροι
όλγοι· τῶν δὲ ἡμέρων καὶ ὡνομασμένα τὰ πλείω
καὶ ἡ αἰσθησις κοινοτέρα· λέγω δ' οἷον ἀμπέλου
συκῆς ρόας μηλέας ἀπίου δάφνης μυρρίνης τῶν
ἄλλων· ἡ γὰρ χρῆσις οὖσα κοινὴ συνθεωρεῖν
ποιεῖ τὰς διαφοράς.

5 **"Ιδιον δὲ καὶ τοῦτ' ἐφ' ἔκατέρων· τὰ μὲν γὰρ**
ἄγρια τῷ ἄρρενι καὶ τῷ θῆλει ἡ μόνοις ἡ μάλιστα
διαιροῦσι, τὰ δὲ ἥμερα πλείοσιν ἰδέαις. ἔστι δὲ
τῶν μὲν ράον λαβεῖν καὶ διαριθμῆσαι τὰ εἴδη,
τῶν δὲ χαλεπώτερον διὰ τὴν πολυχοῖαν.

'Αλλὰ δὴ τὰς μὲν τῶν μορίων διαφορὰς καὶ τῶν
ἄλλων οὐσιῶν ἐκ τούτων πειρατέον θεωρεῖν. περὶ
δὲ τῶν γενέσεων μετὰ ταῦτα λεκτέον· τοῦτο γὰρ
ῶσπερ ἐφεξῆς τοῖς εἰρημένοις ἔστιν.

of plants too there is a class which cannot grow except¹ in moisture, while others will indeed grow on dry land, but they lose their character and are inferior. Again of all trees, one might almost say, and of all plants there are several forms to each kind ; for hardly any kind contains but a single form. But the plants which are called respectively cultivated and wild shew this difference in the clearest and most emphatic way, for instance the cultivated and wild forms of fig olive and pear. In each of these pairs there are differences in fruit and leaves, and in their forms and parts generally. But most of the wild kinds have no names and few know about them, while most of the cultivated kinds have received names² and they are more commonly observed ; I mean such plants as vine fig pomegranate apple pear bay myrtle and so forth ; for, as many people make use of them, they are led also to study the differences.

But there is this peculiarity as to the two classes respectively ; in the wild kinds men find only or chiefly the distinction of 'male' and 'female,' while in the cultivated sorts they recognise a number of distinguishing features. In the former case it is easy to mark and count up the different forms, in the latter it is harder because the points of difference are numerous.

However we have said enough for study of the differences between parts and between general characters. We must now speak of the methods of growth, for this subject comes naturally after what has been said.

¹ μὴ add. W.

² ὄνομασμένα τὰ πλείω conj. Sch. ; ὄνομασμένων πλείω Ald.

BOOK II

Β

Ι. Αἱ γενέσεις τῶν δένδρων καὶ ὅλως τῶν φυτῶν ἡ αὐτόμαται ἡ ἀπὸ σπέρματος ἡ ἀπὸ ρίζης ἡ ἀπὸ παρασπάδος ἡ ἀπὸ ἀκρεμόνος ἡ ἀπὸ κλωνὸς ἡ ἀπ' αὐτοῦ τοῦ στελέχους εἰσίν, ἡ ἔτι τοῦ ξύλου κατακοπέντος εἰς μικρά· καὶ γὰρ οὕτως ἔνια φύεται. τούτων δὲ ἡ μὲν αὐτόματος πρώτη τις, αἱ δὲ ἀπὸ σπέρματος καὶ ρίζης φυσικώταται δόξαιεν ἄν· ὥσπερ γὰρ αὐτόμαται καὶ αὐταί· δι' ὃ καὶ τοὺς ἀγρίοις ὑπάρχουσιν· αἱ δὲ ἄλλαι τέχνης ἡ δὴ προαιρέσεως.

2 "Απαντα δὲ βλαστάνει κατά τινα τῶν τρόπων τούτων, τὰ δὲ πολλὰ κατὰ πλείους· ἐλάα μὲν γὰρ πάντως φύεται πλὴν ἀπὸ τοῦ κλωνός· οὐ γὰρ δύναται καταπηγνυμένη, καθάπερ ἡ συκῆ τῆς κράδης καὶ ἡ ρόα τῆς ράβδου. καίτοι φασί γέ τινες ἥδη καὶ χάρακος παγείστης καὶ πρὸς τὸν κιττὸν συμβιῶσαι καὶ γενέσθαι δένδρον· ἀλλὰ σπάνιόν τι τὸ τοιοῦτον· θάτερα δὲ τὰ πολλὰ τῆς φύσεως. συκῆ δὲ τοὺς μὲν ἄλλους τρόπους

¹ ἔνια φύεται conj. Sch.; ἀναφύεται Ald.

BOOK II

OF PROPAGATION, ESPECIALLY OF TREES.

Of the ways in which trees and plants originate. Instances of degeneration from seed.

I. THE ways in which trees and plants in general originate are these :—spontaneous growth, growth from seed, from a root, from a piece torn off, from a branch or twig, from the trunk itself; or again from small pieces into which the wood is cut up (for some trees can be produced¹ even in this manner). Of these methods spontaneous growth comes first, one may say, but growth from seed or root would seem most natural; indeed these methods too may be called spontaneous; wherefore they are found even in wild kinds, while the remaining methods depend on human skill or at least on human choice.

However all plants start in one or other of these ways, and most of them in more than one. Thus the olive is grown in all the ways mentioned, except from a twig; for an olive-twig will not grow if it is set in the ground, as a fig or pomegranate will grow from their young shoots. Not but what some say that cases have been known in which, when a stake of olive-wood was planted to support ivy, it actually lived along with it and became a tree; but such an instance is a rare exception, while the other methods of growth are in most cases the natural ones. The fig grows in all the ways mentioned,

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φύεται πάντας, ἀπὸ δὲ τῶν πρέμνων καὶ τῶν
ξύλων οὐ φύεται· μηλέα δὲ καὶ ἄπιος καὶ ἀπὸ
τῶν ἀκρεμόνων σπανίως. οὐ μὴν ἀλλὰ τά γε
πολλὰ ἡ πάνθ' ὡς εἰπεῖν ἐνδέχεσθαι δοκεῖ καὶ
ἀπὸ τούτων, ἐὰν λεῖοι καὶ νέοι καὶ εὐαυξεῖς ὡσιν.
ἀλλὰ φυσικώτεραί πως ἐκεῖναι· τὸ δὲ ἐνδεχόμενον
ὡς δυνατὸν ληπτέον.

3 "Ολας γὰρ ὀλίγα τὰ ἀπὸ τῶν ἄνω μᾶλλον
βλαστάνοντα καὶ γεννώμενα, καθάπερ ἀμπελος
ἀπὸ τῶν κλημάτων· αὕτη γὰρ οὐκ ἀπὸ τῆς
πρώρας ἀλλ' ἀπὸ τοῦ κλήματος φύεται, καὶ εἰ δή
τι τοιοῦτον ἔτερον ἡ δένδρον ἡ φρυγανῶδες, ὥσπερ
δοκεῖ τό τε πήγανον καὶ ἡ ἴωνια καὶ τὸ σισύμ-
βριον καὶ ὁ ἔρπυλλος καὶ τὸ ἐλένιον. κοινοτάτη
μὲν οὖν ἐστὶ πᾶσιν ἡ τε ἀπὸ τῆς παρασπάδος καὶ
ἀπὸ σπέρματος. ἄπαντα γὰρ ὅσα ἔχει σπέρματα
καὶ ἀπὸ σπέρματος γίνεται· ἀπὸ δὲ παρασπάδος
καὶ τὴν δάφνην φασίν, ἐάν τις τὰ ἔρνη παρελῶν
φυτεύσῃ. δεῖ δὲ ὑπόρριζον είναι μάλιστά γε τὸ
παρασπώμενον ἡ ὑπόπρεμνον. οὐ μὴν ἀλλὰ καὶ
ἄνευ τούτου θέλει βλαστάνειν καὶ ρόα καὶ μηλέα
ἐαρινή· βλαστάνει δὲ καὶ ἀμυγδαλῆ φυτευομένη.
4 κατὰ πλείστους δὲ τρόπους ὡς εἰπεῖν ἡ ἐλάα
βλαστάνει· καὶ γὰρ ἀπὸ τοῦ στελέχους καὶ ἀπὸ
τοῦ πρέμνου κατακοπτομένου καὶ ἀπὸ τῆς ρίζης
[καὶ ἀπὸ τοῦ ξύλου] καὶ ἀπὸ ράβδου καὶ χάρακος
ὥσπερ εἴρηται. τῶν δ' ἄλλων ὁ μύρρινος· καὶ
γὰρ οὗτος ἀπὸ τῶν ξύλων καὶ τῶν πρέμνων

¹ τά γε πολλὰ πάνθ' conj. Sch.; ἡ before πάνθ' ins. St.; τά
τε πολλὰ πάνθ' Ald.

² εὐαυξεῖς conj. H.; αὐξεῖς UMVAld.

³ οὐκ I conj.; οὐδ' MSS.

except from root-stock and cleft wood ; apple and pear grow also from branches, but rarely. However it appears that most, if not practically all,¹ trees may grow from branches, if these are smooth young and vigorous.² But the other methods, one may say, are more natural, and we must reckon what may occasionally occur as a mere possibility.

In fact there are quite few plants which grow and are brought into being more easily from the upper parts, as the vine is grown from branches ; for this, though it cannot³ be grown from the 'head,'⁴ yet can be grown from the branch, as can all similar trees and under-shrubs, for instance, as it appears, rue gilliflower bergamot-mint tufted thyme calamint. So the commonest ways of growth with all plants are from a piece torn off or from seed ; for all plants that have seeds grow also from seed. And they say that the bay too grows⁵ from a piece torn off, if one takes off the young shoots and plants them ; but it is necessary that the piece torn off should have part of the root or stock⁶ attached to it. However the pomegranate and 'spring apple'⁷ will grow even without this, and a slip of almond⁸ grows if it is planted. The olive grows, one may say, in more ways than any other plant ; it grows from a piece of the trunk or of the stock,⁹ from the root, from a twig, and from a stake, as has been said.¹⁰ Of other plants the myrtle also can be propagated in several ways ; for this too grows from pieces of wood

⁴ πρώπας, cf. Col. 3. 10. 1, *caput vitis* *vocat πρώπαν*. Sch. restores the word, *C.P.* 3. 14. 7.

⁵ cf. *C.P.* 1. 3. 2. ⁶ i.e. a 'heel' (Lat. *perna*).

⁷ cf. *C.P.* 2. 11. 6 ; *Athen.* 3. 23. ⁸ cf. *Geop.* 10. 3. 9.

⁹ καὶ ἀπὸ τοῦ ξύλου om. Julius Pontedeva on *Varro* 1. 39. 3 : a gloss on ἀπὸ τοῦ πρέμνου κατακ. ¹⁰ 2. 1. 2.

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φύεται. δεῖ δὲ καὶ τούτου καὶ τῆς ἐλάσιας τὰ ξύλα διαιρεῖν μὴ ἐλάττω σπιθαμιαίων καὶ τὸν φλοιὸν μὴ περιαιρεῖν.

Τὰ μὲν οὖν δένδρα βλαστάνει καὶ γίνεται κατὰ τοὺς εἰρημένους τρόπους· αἱ γὰρ ἐμφυτεῖαι καὶ οἱ ἐνοφθαλμισμοὶ καθάπερ μίξεις τινές εἰσιν ἡ κατ' ἄλλον τρόπον γενέσεις, περὶ ὧν ὕστερον λεκτέον.

II. Τῶν δὲ φρυγανωδῶν καὶ ποιωδῶν τὰ μὲν πλεῖστα ἀπὸ σπέρματος ἡ ρίζης τὰ δὲ καὶ ἀμφοτέρως ἔνια δὲ καὶ ἀπὸ τῶν βλαστῶν, ὥσπερ εἰρηται. ρόδωνία δὲ καὶ κρινωνία κατακοπέντων τῶν καυλῶν, ὥσπερ καὶ ἡ ἄγρωστις. φύεται δὲ ἡ κρινωνία καὶ ἡ ρόδωνία καὶ ὅλου τοῦ καυλοῦ τεθέντος. ἴδιωτάτη δὲ ἡ ἀπὸ δακρύου· καὶ γὰρ οὕτω δοκεῖ τὸ κρίνον φύεσθαι, ὅταν ξηρανθῇ τὸ ἀπορρυέν. φασὶ δὲ καὶ ἐπὶ τοῦ ἴπποσελίνου· καὶ γὰρ τούτο ἀφίησι δάκρυον. φύεται δέ τις καὶ κάλαμος, ἐάν τις διατέμνων τὰς ἡλακάτας πλαγίας τιθῇ καὶ κατακρύψῃ κόπρῳ καὶ γῇ. ἴδιας δὲ ἀπὸ ρίζης [τῷ] φύεσθαι καὶ τὰ κεφαλόρριζα.

2 Τοσανταχῶς δὲ οὕσης τῆς δυνάμεως τὰ μὲν πολλὰ τῶν δένδρων, ὥσπερ ἐλέχθη πρότερον, ἐν πλείοσι τρόποις φύεται· ἔνια δὲ ἀπὸ σπέρματος

¹ ἐμφυτεῖαι conj. R. Const.; ἐμφυλέαι (with erasures) U; ἐμφυλεῖαι V; ἐμφυλεῖαι Ald.

² 2. 1. 3; cf. C.P. 1. 4. 4 and 6.

³ i.e. bulbil. cf. 6. 6. 8; 9. 1. 4; C.P. 1. 4. 6; Plin. 21. 24.

⁴ ἐπὶ conj. W.; ἀπὸ P₂Ald.

⁵ δέ τις καὶ Ald.; τις om. W. after Sch.

and also from pieces of the stock. It is necessary however with this, as with the olive, to cut up the wood into pieces not less than a span long and not to strip off the bark.

Trees then grow and come into being in the above-mentioned ways; for as to methods of grafting¹ and inoculation, these are, as it were, combinations of different kinds of trees; or at all events these are methods of growth of a quite different class and must be treated of at a later stage.

II. Of under-shrubs and herbaceous plants the greater part grow from seed or a root, and some in both ways; some of them also grow from cuttings, as has been said,² while roses and lilies grow from pieces of the stems, as also does dog's-tooth grass. Lilies and roses also grow when the whole stem is set. Most peculiar is the method of growth from an exudation³; for it appears that the lily grows in this way too, when the exudation that has been produced has dried up. They say the same of⁴ alexanders, for this too produces an exudation. There is a certain⁵ reed also which grows if one cuts it in lengths from joint to joint and sets them⁶ sideways, burying it in dung and soil. Again they say that plants which have a bulbous root are peculiar in their way of growing⁷ from the root.

The capacity for growth being shewn in so many ways, most trees, as was said before,⁸ originate in several ways; but some come⁹ only from seed, as silver-

⁶ cf. 1. 4. 4; Plin. 17. 145; Col. 4. 32. 2; $\tau\iota\theta\hat{\eta}$ conj. Sch.; $\tau\iota\theta\hat{\eta}$ Ald.; $\tau\iota\theta\hat{\eta}$.

⁷ i.e. by offset bulbs. Text probably defective; cf. C.P. 1. 4. 1. $\tau\hat{\eta}$ U; $\tau\hat{\eta}$ U.M.V. ⁸ 2. 1. 1.

⁹ $\phi\acute{\eta}\epsilon\tau\alpha$ I conj.; $\phi\eta\sigma\iota\nu\acute{\epsilon}\sigma\tau\iota\nu$ or $\phi\alpha\sigma\iota\nu\acute{\epsilon}\sigma\tau\iota\nu$ MSS.; $\omega\acute{s}$ $\phi\alpha\sigma\iota\nu\acute{\epsilon}\sigma\tau\iota\nu$ Ald.; $\pi\alpha\pi\gamma\acute{\iota}\nu\epsilon\tau\alpha$ conj. W.

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φύεται μόνον, οἷον ἐλάτη πεύκη πίτυς ὅλως πᾶν τὸ κωνοφόρον· ἔτι δὲ καὶ φοῖνιξ, πλὴν εἰ ἄρα ἐν Βαθυλῶνι καὶ ἀπὸ τῶν ρύθδων [ῶς] φασί τινες μολεύειν. κυπάριττος δὲ παρὰ μὲν τοῖς ἄλλοις ἀπὸ σπέρματος, ἐν Κρήτῃ δὲ καὶ ἀπὸ τοῦ στελέχους, οἷον ἐπὶ τῆς ὁρείας ἐν Τάρρᾳ· παρὰ τούτοις γάρ ἐστιν ἡ κουριζομένη κυπάριττος· αὕτη δὲ ἀπὸ τῆς τομῆς βλαστάνει πάντα τρόπου τεμνομένη καὶ ἀπὸ γῆς καὶ ἀπὸ τοῦ μέσου καὶ ἀπὸ τοῦ ἀνωτέρω· βλαστάνει δὲ ἐνιαχοῦ καὶ ἀπὸ τῶν ρίζων σπανίως δέ.

3 Περὶ δὲ δρυὸς ἀμφισβητοῦσιν· οἱ μὲν γὰρ ἀπὸ σπέρματός φασι μόνον, οἱ δὲ καὶ ἀπὸ ρίζης γλίσχρως· οἱ δὲ καὶ ἀπ' αὐτοῦ τοῦ στελέχους κοπέντος. ἀπὸ παρασπάδος δὲ καὶ ρίζης οὐδὲν φύεται τῶν μὴ παραβλαστανόντων.

4 Ἀπάντων δὲ ὅσων πλείους αἱ γενέσεις, ἡ ἀπὸ παρασπάδος καὶ ἔτι μᾶλλον ἡ ἀπὸ παραφυάδος ταχίστη καὶ εὐαυξήσ, ἐὰν ἀπὸ ρίζης ἡ παραφυὰς ἡ. καὶ τὰ μὲν οὔτως ἡ ὅλως ἀπὸ φυτευτηρίων πεφυτευμένα πάντα δοκεῖ τοὺς καρπούς ἔξομοιούν. ὅσα δ' ἀπὸ τοῦ καρποῦ τῶν δυναμένων καὶ οὔτως βλαστάνειν, ἀπανθ' ὡς εἰπεῖν χείρω, τὰ δὲ καὶ ὅλως ἔξισταται τοῦ γένους, οἷον ἀμπελος μηλέα συκῆ ροιὰ ἄπιος· ἔκ τε γὰρ τῆς κεγχραμίδος οὐδὲν γίνεται γένος ὅλως ἥμερον, ἀλλ' ἡ ἐρινεὸς ἡ ἀγρία συκῆ, διαφέρουσα πολλάκις καὶ τῇ χροίᾳ· καὶ γὰρ ἐκ μελαίνης λευκὴ καὶ ἐκ λευκῆς μέλαινα

¹ μολεύειν conj. Sch.; μωλύειν MSS.; μοσχεύειν conj. R. Const. (cf. C.P. 1. 2 1). But cf. Hesych. s.v. μολεύειν.

² Plin. 16. 141.

³ ἐπι conj. W.; τὸ UMVald.

ENQUIRY INTO PLANTS, II. II. 2-4

fir fir Aleppo pine, and in general all those that bear cones: also the date-palm, except that in Babylon it may be that, as some say, they take cuttings¹ from it. The cypress in most regions grows from seed, but in Crete² from the trunk also, for instance in³ the hill country about Tarra; for there grows the cypress which they clip, and when cut it shoots in every possible way, from the part which has been cut, from the ground, from the middle, and from the upper parts; and occasionally, but rarely, it shoots from the roots also.

About the oak accounts differ; some say it only grows from seed, some from the root also, but not vigorously, others again that it grows from the trunk itself, when this is cut. But no tree grows from a piece torn off or from a root except those which make side-growths.

However in all the trees which have several methods of originating the quickest method and that which promotes the most vigorous growth is from a piece torn off, or still better from a sucker, if this is taken from the root. And, while all the trees which are propagated thus or by some kind of slip⁴ seem to be alike in their fruits to the original tree, those raised from the fruit, where this method of growing is also possible, are nearly all inferior, while some quite lose the character of their kind, as vine apple fig pomegranate pear. As for the fig,⁵ no cultivated kind is raised from its seed, but either the ordinary wild fig or some wild kind is the result, and this often differs in colour from the parent; a black fig gives a

¹ φυτευτήριον: a general term including παραφυτός and παρασπός.

² cf. C.P. I. 9.

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γίνεται· ἔκ τε τῆς ἀμπέλου τῆς γενναίας ἀγεννής· καὶ πολλάκις ἔτερον γένος· ὅτε δὲ ὅλως οὐδὲν ἥμερον ἀλλ' ἄγριον ἐνίστηται καὶ τοιοῦτον ὥστε μὴ ἐκπέττειν τὸν καρπόν· αἱ δὲ ὥστε μηδὲ ἀδρύνειν ἀλλὰ μέχρι τοῦ ἀνθῆσαι μόνον ἀφικνεῖσθαι.

5 Φύονται δὲ καὶ ἔκ τῶν τῆς ἑλάας πυρήνων ἄγριέλαιος, καὶ ἔκ τῶν τῆς ρόας κόκκων τῶν γλυκέων ἀγεννεῖς, καὶ ἔκ τῶν ἀπυρήνων σκληραί, πολλάκις δὲ καὶ ὀξεῖαι. τὸν αὐτὸν δὲ τρόπον καὶ ἔκ τῶν ἀπίων καὶ ἔκ τῶν μηλέων· ἔκ μὲν γὰρ τῶν ἀπίων μοχθηρὰ ἡ ἀχράς, ἔκ δὲ τῶν μηλέων χείρων τε τῷ γένει καὶ ἔκ γλυκείας ὀξεῖα, καὶ ἔκ στρουθίου Κυδώνιος. χείρων δὲ καὶ ἡ ἀμυγδαλῆ καὶ τῷ χυλῷ καὶ τῷ σκληρά ἔκ μαλακῆς· δι' ὅ καὶ αὐξηθεῖσαν ἐγκεντρίζειν κελεύουσιν, εἰ δὲ μὴ τὸ μόσχευμα μεταφυτεύειν πολλάκις.

6 Χείρων δὲ καὶ ἡ δρῦς· ἀπὸ γοῦν τῆς ἐν Πύρρᾳ πολλοὶ φυτεύσαντες οὐκ ἐδύνανθ' ὄμοίαν ποιεῖν. δάφνην δὲ καὶ μυρρήν διαφέρειν ποτέ φασιν, ὡς ἐπὶ τὸ πολὺ δὲ ἔξιστασθαι καὶ οὐδὲ τὸ χρῶμα διασώζειν, ἀλλ' ἔξι ἐρυθροῦ καρποῦ γίνεσθαι μέλαιναν, ὥσπερ καὶ τὴν ἐν Ἀντάνδρῳ πολλάκις δὲ καὶ τὴν κυπάριστον ἔκ θηλείας ἄρρενα. μάλιστα δὲ τούτων ὁ φοῖνιξ δοκεῖ διαμένειν ὥσπερ εἰπεῖν τελείως τῶν ἀπὸ σπέρματος, καὶ πεύκη ἡ κωνοφόρος καὶ πίτυς ἡ φθειροποιός. ταῦτα μὲν οὖν ἐν τοῖς ἥμερωμένοις. ἐν δὲ τοῖς

¹ φύονται conj. W.; φυτεύονται Ald. H.; φύεται Vo. cod. Cas.

² γλυκέων conj. St.; γλαυκίων UΜV Ald.

³ cf. Athen. 3. 20 and 23.

⁴ cf. C.P. 1. 9. 1.

⁵ In Lesbos; cf. 3. 9. 5.

⁶ cf. C.P. 1. 9. 2.

ENQUIRY INTO PLANTS, II. II. 4-6

white, and conversely. Again the seed of an excellent vine produces a degenerate result, which is often of quite a different kind; and at times this is not a cultivated kind at all, but a wild one of such a character that it does not ripen its fruit; with others again the result is that the seedlings do not even mature fruit, but only get as far as flowering.

Again the stones of the olive give¹ a wild olive, and the seeds of a sweet pomegranate² give a degenerate kind, while the stoneless kind gives a hard sort and often an acid fruit. So also is it with seedlings of pears and apples; pears give a poor sort of wild pears, apples produce an inferior kind which is acid instead of sweet; quince produces wild quince.³ Almond again raised from seed is inferior in taste and in being hard instead of soft; and this is why men⁴ bid us graft on to the almond, even when it is fully grown, or, failing that, frequently plant the offsets.

The oak also deteriorates from seed; at least many persons having raised trees from acorns of the oak at Pyrrha⁵ could not produce one like the parent tree. On the other hand they say that bay and myrtle sometimes improve by seeding, though usually they degenerate and do not even keep their colour, but red fruit gives black—as happened with the tree in Antandros; and frequently seed of a ‘female’ cypress produces a ‘male’ tree. The date-palm seems to be about the most constant of these trees, when raised from seed, and also the ‘cone-bearing pine’⁶ (stone-pine) and the ‘lice-bearing pine’.⁷ So much for degeneration in cultivated trees; among wild kinds it is plain that more in proportion

⁷ Plin. 16. 49. The ‘lice’ are the seeds which were eaten. cf. Hdt. 4. 109, *φθειροτραγέουσι*; Theocr. 5. 49.

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ἀγρίοις δῆλον ὅτι πλείω κατὰ λόγον ὡς ἴσχυροτέροις· ἐπεὶ θάτερόν γε καὶ ἄτοπον, εἰ δὴ χείρω καὶ ἐν ἐκείνοις καὶ ὅλως ἐν τοῖς ἀπὸ σπέρματος μόνον· εἰ μή τι τῇ θεραπείᾳ δύνανται μεταβάλλειν.

7 Διαφέρουσι δὲ καὶ τόποι τόπων καὶ ἀὴρ ἀέρος· ἐνιαχοῦ γὰρ ἐκφέρειν η̄ χώρα δοκεῖ τὰ δμοια, καθάπερ καὶ ἐν Φιλίπποις· ἀνάπταλιν ὀλίγα καὶ ὀλιγαχοῦ λαμβάνειν μεταβολήν, ὥστε ἐκ σπέρματος ἀγρίου ποιεῖν ἡμερον η̄ ἐκ χείρονος ἀπλῶς βέλτιον· τοῦτο γὰρ ἐπὶ τῆς ῥόας μόνον ἀκηκόαμεν ἐν Αἰγύπτῳ καὶ ἐν Κιλικίᾳ συμβαίνειν· ἐν Αἰγύπτῳ μὲν γὰρ τὴν ὀξεῖαν καὶ σπαρεῖσαν καὶ φυτευθεῖσαν γλυκεῖαν γίνεσθαι πως η̄ οἰνώδη· περὶ δὲ Σόλους τῆς Κιλικίας περὶ ποταμὸν τὸν Πίναρον, οὐδὲ μάχη πρὸς Δαρεῖον ἐγένετο, πᾶσαι γίνονται ἀπύρηνοι.

8 Εὔλογον δὲ καὶ εἴ τις τὸν παρ' ἡμῶν φοίνικα φυτεύοι ἐν Βαβυλῶνι, κάρπιμόν τε γίνεσθαι καὶ ἐξομοιοῦσθαι τοῖς ἐκεῖ· τὸν αὐτὸν δὲ τρόπον καὶ εἴ τις ἑτέρα προσάλληλον ἔχει καρπὸν τόπῳ· κρείττων γὰρ οὗτος τῆς ἐργασίας καὶ τῆς θεραπείας. σημεῖον δ' ὅτι μεταφερόμενα τάκεῖθεν ἄκαρπα τὰ δὲ καὶ ὅλως ἀβλαστῆ γίνεται.

9 Μεταβάλλει δὲ καὶ τῇ τροφῇ καὶ διὰ τὴν

¹ i.e. that they should improve from seed.

² Whereas wild trees are produced only from seed.

³ i.e. improve a degenerate seedling.

⁴ ἀπλῶς: ? om. Sch. ⁵ cf. C.P. 1. 9. 2.

ENQUIRY INTO PLANTS, II. II. 6-9

degenerate from seed, since the parent trees are stronger. For the contrary¹ would be very strange, seeing that degenerate forms are found even in cultivated trees,² and among these only in those which are raised from seed. (As a general rule these are degenerate, though men may in some cases effect a change³ by cultivation).

Effects of situation, climate, tendance.

Again differences in situation and climate affect the result. In some places, as at Philippi, the soil seems to produce plants which resemble their parent; on the other hand a few kinds in some few places seem to undergo a change, so that wild seed gives a cultivated form, or a poor form one actually better.⁴ We have heard that this occurs, but only with the pomegranate, in Egypt⁵ and Cilicia; in Egypt a tree of the acid kind both from seeds and from cuttings produces one whose fruit has a sort of sweet taste,⁶ while about Soli in Cilicia near the river Pinaros (where the battle with Darius was fought) all those pomegranates raised from seed are without stones.

If anyone were to plant our palm at Babylon, it is reasonable to expect that it would become fruitful and like the palms of that country. And so would it be with any other country which has fruits that are congenial to that particular locality; for the locality⁷ is more important than cultivation and tendance. A proof of this is the fact that things transplanted thence become unfruitful, and in some cases refuse to grow altogether.

There are also modifications due to feeding⁸ and

⁶ Or 'wine-like.' Cited by Apollon. *Hist. Mir.* 43.

⁷ οὐτος conj. W.; αὐτὸς Ald.

⁸ τῇ τροφῇ conj. W.; τῆς τροφῆς UMVAld.

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ἄλλην ἐπιμέλειαν, οἵς καὶ τὸ ἄγριον ἐξημεροῦται καὶ αὐτῶν δὲ τῶν ἡμέρων ἔνια ἀπαγριοῦται, οἵον ῥόα καὶ ἀμυγδαλῆ. ἥδη δέ τινες καὶ ἐκ κριθῶν ἀναφύναι φασι πυροὺς καὶ ἐκ πυρῶν κριθὰς καὶ 10 ἐπὶ τοῦ αὐτοῦ πυθμένος ἄμφω. ταῦτα μὲν οὖν ὡς μυθωδέστερα δεῖ δέχεσθαι. μεταβάλλει δ' οὖν τὰ μεταβάλλοντα τὸν τρόπον τοῦτον αὐτομάτως· ἔξαλλαγή δὲ χώρας, ὥσπερ ἐν Αἰγύπτῳ καὶ Κιλικίᾳ περὶ τῶν ῥῶν εἴπομεν, οὐδὲ διὰ μίαν θεραπείαν.

‘Ωσαύτως δὲ καὶ ὅπου τὰ κάρπιμα ἄκαρπα γίνεται, καθάπερ τὸ πέρσιον τὸ ἐξ Αἰγύπτου καὶ ὁ φοῖνιξ ἐν τῇ Ἑλλάδι καὶ εἰ δή τις κομίσειε τὴν ἐν Κρήτῃ λεγομένην αἴγειρον. ἔνιοι δέ φασι καὶ τὴν ὅην ἐὰν εἰς ἀλεεινὸν ἔλθη σφόδρα τόπον ἄκαρπον γίνεσθαι φύσει γὰρ ψυχρόν. εὐλογον δὲ ἀμφότερα συμβαίνειν κατὰ τὰς ἐναντιώσεις, εἴπερ μηδ² ὅλως ἔνια φύεσθαι θέλει μεταβάλλοντα τοὺς τόπους. καὶ κατὰ μὲν τὰς χώρας αἱ τοιαῦται μεταβολαί.

11 Κατὰ δὲ τὴν φυτείαν τὰ ἀπὸ τῶν σπερμάτων φυτευόμενα, καθάπερ ἐλέχθη· παντοῖαι γὰρ αἱ ἔξαλλαγαὶ καὶ τούτων. τῇ θεραπείᾳ δὲ μεταβάλλει ῥόα καὶ ἀμυγδαλῆ· ῥόα μὲν κόπρον ὑείαν λαβοῦσα καὶ ὕδατος πλῆθος ῥυτοῦ· ἀμυγδαλῆ δὲ ὅταν πάτταλόν τις ἐνθῇ, καὶ τὸ δάκρυον ἀφαιρῇ τὸ ἐπιρρέον πλείω χρόνον καὶ τὴν ἄλλην ἀποδιδῷ

¹ ἔνια ἀπαγριοῦται οἷον conj. W.; ἔνια καὶ ἀπορῇ τε ῥά UV; ἐ. καὶ ἀπορῇ τὰ ῥά M; ἐ. καὶ ἀπορρεῖ τὰ ῥά Ald.

² i.e. cultivation has nothing to do with it.

³ 2. 2. 7. ⁴ cf. 3. 3. 4. ⁵ Plin. 17. 242.

⁶ i.e. improve. cf. 2. 2. 6 ad fin.

ENQUIRY INTO PLANTS, II. II. 9-11

attention of other kinds, which cause the wild to become cultivated, or again cause some cultivated kinds to go wild,¹ such as pomegranate and almond. Some say that wheat has been known to be produced from barley, and barley from wheat, or again both growing on the same stool; but these accounts should be taken as fabulous. Anyhow those things which do change in this manner do so spontaneously,² and the alteration is due to a change of position (as we said³ happens with pomegranates in Egypt and Cilicia), and not to any particular method of cultivation.

So too is it when fruit-bearing trees become unfruitful, for instance the *persim* when moved from Egypt, the date-palm when planted in Hellas, or the tree which is called 'poplar' in Crete,⁴ if anyone should transplant it.⁵ Some again say that the sorb becomes unfruitful if it comes into a very warm position, since it is by nature cold-loving. It is reasonable to suppose that both results follow because the natural circumstances are reversed, seeing that some things entirely refuse to grow when their place is changed. Such are the modifications due to position.

As to those due to method of culture, the changes which occur in things grown from seed are as was said; (for with things so grown also the changes are of all kinds). Under cultivation the pomegranate and the almond change character,⁶ the pomegranate if it receives pig-manure⁷ and a great deal of river water, the almond if one inserts a peg and⁸ removes for some time the gum which exudes and gives the other

¹ cf. C.P. 2. 14. 2; 3. 9. 3; Plin. 17. 259; Col. 5. 10. 15 and 16.

² cf. 2. 7. 6; C.P. 1. 17. 10; 2. 14. 1; Plin. 17. 252.

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12 θεραπείαν. ὡσαύτως δὲ δῆλον ὅτι καὶ ὅσα ἔξημεροῦται τῶν ἀγρίων ἡ ἀπαγριοῦται τῶν ἡμέρων· τὰ μὲν γὰρ θεραπείᾳ τὰ δὲ ἀθεραπευσίᾳ μεταβάλλει· πλὴν εἴ τις λέγοι μηδὲ μεταβολὴν ἀλλ' ἐπίδοσιν εἰς τὸ βέλτιον εἶναι καὶ χεῖρον· οὐ γὰρ οἶν τε τὸν κότινον ποιεῖν ἐλάαν οὐδὲ τὴν ἀχράδα ποιεῖν ἄπιον οὐδὲ τὸν ἐρινεὸν συκῆν. ὁ γὰρ ἐπὶ τοῦ κοτίνου φασὶ συμβαίνειν, ὥστ' ἐὰν περικοπεὶς τὴν θαλίαν ὅλως μεταφυτευθῆ φέρειν φαυλίας, μετακίνησίς τις γίνεται οὐ μεγάλη. ταῦτα μὲν οὖν ὁποτέρως δεῖ λαβεῖν οὐθὲν ἀν διαφέροι.

III. Φασὶ δὲ οὖν αὐτομάτην τινὰ γίνεσθαι τῶν τοιούτων μεταβολήν, ὅτε μὲν τῶν καρπῶν ὅτε δὲ καὶ ὅλως αὐτῶν τῶν δένδρων, ἀ καὶ σημεῖα νομίζουσιν οἱ μάντεις· οἰον ῥόαν ὀξεῖαν γλυκεῖαν ἔξενεγκεῖν καὶ γλυκεῖαν ὀξεῖαν· καὶ πάλιν ἀπλῶς αὐτὰ τὰ δένδρα μεταβάλλειν, ὥστε ἐξ ὀξείας γλυκεῖαν γίνεσθαι καὶ ἐκ γλυκείας ὀξεῖαν· χεῖρον δὲ τὸ εἰς γλυκεῖαν μεταβάλλειν. καὶ ἐξ ἐρινεοῦ συκῆν καὶ ἐκ συκῆς ἐρινεόν· χεῖρον δὲ τὸ ἐκ συκῆς. καὶ ἐξ ἐλάας κότινον καὶ ἐκ κοτίνου ἐλάαν· ἥκιστα δὲ τοῦτο. πάλιν δὲ συκῆν ἐκ

¹ περικοπεῖς conj. W.; περισκοπτεῖς U; περικόπτης Ald.

² φαυλίας conj. Salm.; φαύλους U; θάλος Ald. cf. Plin. 16. 244. These olives produced little oil, but were valued for perfumery: see C.P. 6. 8. 3 and 5; *de odor.*, 15.

³ οὐ add. Salm.; om. MSS. (?) Ald. H.

ENQUIRY INTO PLANTS, II. II. II-III. I

attention required. In like manner plainly some wild things become cultivated and some cultivated things become wild; for the one kind of change is due to cultivation, the other to neglect:—however it might be said that this is not a change but a natural development towards a better or an inferior form; (for that it is not possible to make a wild olive pear or fig into a cultivated olive pear or fig). As to that indeed which is said to occur in the case of the wild olive, that if the tree is transplanted with its top-growth entirely cut off,¹ it produces ‘coarse olives,’² this is no³ very great change. However it can make no difference which way⁴ one takes this.

Of spontaneous changes in the character of trees, and of certain marvels.

III. ⁵Apart from these changes it is said that in such plants there is a spontaneous kind of change, sometimes of the fruit, sometimes of the tree itself as a whole, and soothsayers call such changes portents. For instance, an acid pomegranate, it is said, may produce sweet fruit, and conversely; and again, in general, the tree itself sometimes undergoes a change, so that it becomes sweet⁶ instead of acid, or the reverse happens. And the change to sweet is considered a worse portent. Again a wild fig may turn into a cultivated one, or the contrary change take place; and the latter is a worse portent. So again a cultivated olive may turn into a wild one, or conversely, but the latter change is rare. So again a white fig

⁴ i.e. whether nature or man is said to cause the admitted change. ⁵ Plin. 17. 242.

⁶ i.e. all the fruit are now acid instead of sweet, or the reverse. Sch. brackets $\epsilon\kappa\delta\epsilon\lambda\sigma$. . . $\delta\kappa\epsilon\lambda\sigma$.

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λευκῆς μέλαιναν καὶ ἐκ μελαίνης λευκήν. ὁμοίως δὲ τοῦτο καὶ ἐπὶ ἀμπέλου.

2 Καὶ ταῦτα μὲν ὡς τέρατα καὶ παρὰ φύσιν ὑπολαμβάνουσιν. ὅσα δὲ συνήθη τῶν τοιούτων οὐδὲ θαυμάζουσιν δλως¹ οἶνον τὸ τὴν κάπνειον ἀμπελον καλουμένην καὶ ἐκ μέλανος βότρυος λευκὸν καὶ ἐκ λευκοῦ μέλανα φέρειν οὐδὲ γάρ οἱ μάντεις τὰ τοιαῦτα κρίνουσιν. ἐπεὶ οὐδὲ ἔκεινα, παρ’ οἷς πέφυκεν ἡ χώρα μεταβάλλειν, ὥσπερ ἐλέχθη περὶ τῆς ρόας ἐν Αἰγύπτῳ. ἀλλὰ τὸ ἐνταῦθα θαυμαστόν, διὰ τὸ μίαν μόνον ἡ δύο, καὶ ταύτας ἐν τῷ παντὶ χρόνῳ σπανίας. οὐ μὴν ἀλλ’ εἰπερ συμβαίνει, μᾶλλον ἐν τοῖς καρποῖς γίνεσθαι τὴν παραλλαγὴν ἡ ἐν δλοις τοῖς δένδροις.

3 Ἐπεὶ καὶ τοιαύτη τις ἀταξία γίνεται περὶ τοὺς καρπούς οἷον ἡδη ποτὲ συκῆ τὰ σῦκα ἔφυσεν ἐκ τοῦ ὄπισθεν τῶν θρίων· καὶ ρόα δὲ καὶ ἀμπελος ἐκ τῶν στελεχῶν, καὶ ἀμπελος ἀνευ φύλλων καρπὸν ἡνεγκεν. ἐλάα δὲ τὰ μὲν φύλλα ἀπέβαλε τὸν δὲ καρπὸν ἐξήνεγκεν. ὁ καὶ Θετταλῷ τῷ Πειστράτου γενέσθαι λέγεται. συμβαίνει δὲ καὶ διὰ χειμῶνας τοῦτο καὶ δι’ ἄλλας αἰτίας ἔνια τῶν δοκούντων εἰναι παρὰ λόγον οὐκ δοντων δέ· οἶνον ἐλάα ποτ’ ἀποκαυθεῖσα τελέως ἀνεβλάστησεν δλη, καὶ αὐτὴ καὶ ἡ θαλία. ἐν δὲ τῇ Βοιωτίᾳ καταβρωθέντων τῶν ἐρυῶν ὑπ’ ἀττελέβων πάλιν

¹ ἐπὶ conj. Sch.; ἐξ Ald. H.

² cf. C.P. 5. 3. 1 and 2; Arist. *de gen. an.* 4. 4; Hesych. s.v. καπνίας; Schol. ad Ar. *Vesp.* 151. * 2. 2. 7.

⁴ εἰκὸς has perhaps dropped out. Sch.

⁵ θρίων conj. R. Const., cf. C.P. 5. 1. 7 and 8; 5. 2. 2; ἐρινεῶν P₂Ald. cf. also Athen. 3. 11.

ENQUIRY INTO PLANTS, II. III. 1-3

may change into a black one, and conversely; and similar changes occur in¹ the vine.

Now these changes they interpret as miraculous and contrary to nature; but they do not even feel any surprise at the ordinary changes, for instance, when the 'smoky' vine,² as it is called, produces alike white grapes instead of black or black grapes instead of white. Of such changes the soothsayers take no account, any more than they do of those instances in which the soil produces a natural change, as was said³ of the pomegranate in Egypt. But it is surprising when such a change occurs in our own country, because there are only one or two instances and these separated by wide intervals of time. However, if such changes occur, it is natural⁴ that the variation should be rather in the fruit than in the tree as a whole. In fact the following irregularity also occurs in fruits; a fig-tree has been known to produce its figs from behind the leaves,⁵ pomegranate and vines from the stem, while the vine has been known to bear fruit without leaves. The olive again has been known to lose its leaves and yet produce its fruit; this is said to have happened to Thettalos, son of Pisistratus. This may be due to inclement weather; and some changes, which seem to be abnormal, but are not really so, are due to other accidental causes;⁶ for instance, there was an olive that, after being completely burnt down, sprang up again entire, the tree and all its branches. And in Boeotia an olive whose young shoots⁷ had been eaten off by locusts grew again: in this case however⁸ the

⁶ cf. Hdt. 8. 55; Plin. 17. 241.

⁷ ἐρυῶν conj. Sch.; ἐργῶν P₂Ald.; κλαδῶν mU.

⁸ i.e. the portent was not so great as in the other case quoted, as the tree itself had not been destroyed.

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ἀνεβλάστησε· τὰ δὲ οἶνον ἀπέπεσεν. ἦκιστα δὲ
ἴσως τὰ τοιαῦτα ἄτοπα διὰ τὸ φανερὰς ἔχειν τὰς
αἰτίας, ἀλλὰ μᾶλλον τὸ μὴ ἐκ τῶν οἰκείων τόπων
φέρειν τοὺς καρποὺς ἢ μὴ οἰκείους· καὶ μάλιστα δὲ
εἰ τῆς ὅλης φύσεως γίνεται μεταβολή, καθάπερ
ἔλέχθη. περὶ μὲν οὖν τὰ δένδρα τοιαῦταί
τινές εἰσι μεταβολαί.

IV. Τῶν δὲ ἄλλων τό τε σισύμβριον εἰς μίνθαν δοκεῖ μεταβάλλειν, ἐὰν μὴ κατέχηται τῇ θεραπείᾳ, δι’ δὲ καὶ μεταφυτεύουσι πολλάκις, καὶ ὁ πυρὸς εἰς αἴραν. ταῦτα μὲν οὖν ἐν τοῖς δένδροις αὐτομάτως, εἴπερ γίνεται. τὰ δὲ ἐν τοῖς ἐπετείοις διὰ παρασκευῆς· οἶνον ἡ τίφη καὶ ἡ ζειὰ μεταβάλλουσιν εἰς πυρὸν ἐὰν πτισθεῖσαι σπείρωνται, καὶ τοῦτ’ οὐκ εὐθὺς ἀλλὰ τῷ τρίτῳ ἔτει. σχεδὸν δὲ παραπλήσιον τοῦτό γε τῷ τὰ σπέρματα κατὰ τὰς χώρας μεταβάλλειν μεταβάλλει γὰρ καὶ ταῦτα καθ’ ἑκάστην χώραν καὶ σχεδὸν ἐν τῷ ἴσῳ χρόνῳ καὶ ἡ τίφη. μεταβάλλουσι δὲ καὶ οἱ ἄγριοι πυροὶ καὶ αἱ κριθαὶ θεραπευόμεναι καὶ ἐξημερούμεναι κατὰ τὸν ἴσον χρόνον.

2 Καὶ ταῦτα μὲν ἔοικε χώρας τε μεταβολῆ καὶ θεραπείᾳ γίνεσθαι· καὶ ἔνια ἀμφοτέροις, τὰ δὲ τῇ θεραπείᾳ μόνον· οἶνον πρὸς τὸ τὰ ὅσπρια μὴ γίνεσθαι ἀτεράμονα βρέξαντα κελεύουσιν ἐν νίτρῳ

¹ οἰκεῖος· καὶ I conj.; οἰκειοῦται U M V; οἰκεῖως Ald. H.; έοικότας conj. W. ² εἰ ins. Sch. ³ 2. 3. 1.

⁴ cf. 6. 7. 2; Plin. 19. 176.

⁵ i.e. to prevent the change which cultivated soil induces.

ENQUIRY INTO PLANTS, II. III. 3-IV. 2

shoots had, so to speak, only been shed. But after all such phenomena are perhaps far from strange, since the cause in each case is obvious ; rather is it strange that trees should bear fruit not at the places where it naturally forms, or else fruit which does not belong to the character¹ of the tree. And most surprising of all is it when,² as has been said,³ there is a change in the entire character of the tree. Such are the changes which occur in trees.

Of spontaneous and other changes in other plants.

IV.⁴ Of other plants it appears that bergamot-mint turns into cultivated mint, unless it is fixed by special attention ; and this is why men frequently transplant⁵ it ;⁶ so too wheat turns into darnel. Now in trees such changes, if they occur, are spontaneous, but in annual plants they are deliberately brought about : for instance, one-seeded wheat and rice-wheat change⁷ into wheat, if bruised before they are sown ; and this does not happen at once, but in the third year. This change resembles that produced in the seeds by difference of soil⁸ ; for these grains vary according to the soil, and the change takes about the same time as that which occurs in one-seeded wheat. Again wild wheats and barleys also with tendance and cultivation change in a like period.

These changes appear to be due to change of soil and cultivation, and in some cases the change is due to both, in others to cultivation alone ; for instance, in order that pulses may not become uncookable,⁹

⁶ But see reff. under *αἴρει* in Index.

⁷ cf. C.P. 5. 6. 12 ; Plin. 18. 93.

⁸ χώραν conj. St. ; ἔραν Ald.H.

⁹ ἀτεράμονα conj. W. ; ἀτέραμνα U.Ald. cf. 8. 8. 6 and 7 ; C.P. 4. 7. 2 ; 4. 12. 1 and 8 ; Geop. 2. 35. 2 ; 2. 41.

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νύκτα τῇ ὑστεραίᾳ σπείρειν ἐν ξηρᾷ· φακοὺς ὥστε ἀδροὺς γίνεσθαι φυτεύουσιν ἐν βολίτῳ· τοὺς ἐρεβίνθους δέ, ὥστε μεγάλους, αὐτοῖς τοῖς κελύφεσι βρέξαντα σπείρειν. μεταβάλλουσι δὲ καὶ κατὰ τὰς ὥρας τοῦ σπόρου πρὸς κουφότητα καὶ ἀλυπίαν· οἶν τις τοὺς ὄροβους ἑαρινοὺς σπείρῃ τρισάλυποι γίνονται, καὶ οὐχ ὡς οἱ μετωπωρινοὶ βαρεῖς.

3 Γίνεται δὲ καὶ ἐν τοῖς λαχάνοις μεταβολὴ διὰ τὴν θεραπείαν· οἶν τὸ σέλινον, ἐὰν σπαρὲν καταπατηθῇ καὶ κυλινδρωθῇ, ἀναφύεσθαι φασιν οὐλον. μεταβάλλει δὲ καὶ τὴν χώραν ἐξαλλάττοντα, καθάπερ καὶ τάλλα. καὶ τὰ μὲν τοιαῦτα κοινὰ πάντων ἔστιν. εἰ δὲ κατά τινα πήρωσιν ἡ ἀφαίρεσιν μέρους δένδρον ἄγονον γίνεται, καθάπερ τὰ ζῶα, τοῦτο σκεπτέον· οὐδὲν γοῦν φανερὸν κατά γε τὴν διαιρεσιν εἰς τὸ πλείω καὶ ἐλάττω φέρειν ὥσπερ κακούμενον, ἀλλ’ ἡ ἀπόλλυται τὸ ὅλον ἡ διαμένον καρποφορεῖ. τὸ δὲ γῆρας κοινή τις φθορὰ πᾶσιν.

4 Ἀτοπον δ’ ἀν δόξειε μᾶλλον εἰ ἐν τοῖς ζώοις αἱ τοιαῦται μεταβολαὶ φυσικαὶ καὶ πλείους· καὶ γὰρ κατὰ τὰς ὥρας ἔνια δοκεῖ μεταβάλλειν, ὥσπερ ὁ ἱέραξ καὶ ἔποψις καὶ ἄλλα τῶν ὄμοιών ὄρυνέων. καὶ κατὰ τὰς τῶν τόπων ἀλλοιώσεις, ὥσπερ ὁ ὄρδος εἰς ἔχιν ξηραινομένων τῶν λιβά-

¹ νύκτα I conj.; νυκτὶ MSS.

² ἐν βολίτῳ conj. Milas. on *Geop.* 3. 27; ξυβολον UMV Ald. cf. *C.P.* 5. 6. 11; *Col.* 2. 10. 15; *Plin.* 18. 198.

³ cf. *C.P.* 5. 6. 11; *Geop.* 2. 3. 6.

⁴ ἀλυπίαν conj. Sch.; δι’ ἀλυπίας M; δι’ ἀλυπίαν Ald.

ENQUIRY INTO PLANTS, II. IV. 2-4

men bid one moisten the seed in nitre for a night¹ and sow it in dry ground the next day. To make lentils vigorous they plant the seeds in dung²; to make chick-peas large they bid one moisten the seed while still in the pods,³ before sowing. Also the time of sowing makes differences which conduce to digestibility and harmlessness⁴: thus, if one sows vetches⁵ in spring, they become quite harmless and are not indigestible like those sown in autumn.

Again in pot-herbs change is produced by cultivation; for instance, they say that,⁶ if celery seed is trodden and rolled in after sowing, it comes up curly; it also varies from change of soil, like other things. Such variations are common to all; we must now consider whether a tree, like animals, becomes unproductive from mutilation or removal of a part. At all events it does not appear that division⁷ is an injury, as it were, which affects the amount of fruit produced; either the whole tree perishes, or else, if it survives,⁸ it bears fruit. Old age however is a cause which in all plants puts an end to life. . . .⁹

It would seem more surprising if¹⁰ the following changes occurred in animals naturally and frequently; some animals do indeed seem to change according to the seasons, for instance, the hawk the hoopoe and other similar birds. So also changes in the nature of the ground produce changes in animals, for instance, the water-snake changes into a viper, if the marshes

¹ cf. Plin. 18. 139; Col. 2. 10. 34.

² cf. C.P. 5. 6. 7; Geop. 12. 23. 2.

³ γε conj. Sch.; τε Ald.

⁴ διάμενον conj. Sch.; διαμένοντα Ald.

⁵ Something seems to have been lost at the end of § 3.

¹⁰ ει ins. Sch.; τοιαῦται may however mean 'the above-mentioned,' and refer to something which has been lost.

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δων. φανερώτατα δὲ καὶ κατὰ τὰς γενέσεις ἔνια, καὶ μεταβάλλει διὰ πλειόνων ζώων οἷον ἐκ κάμπης γίνεται χρυσαλλίς εἰτ' ἐκ ταύτης ψυχή· καὶ ἐπ' ἄλλων δ' ἐστὶ τοῦτο πλειόνων, οὐδὲν ἵσως ἄποπον, οὐδ' ὅμοιον τὸ ζητούμενον. ἀλλ' ἐκεῖνο συμβαίνει περὶ τὰ δένδρα καὶ ὄλως πᾶσαν τὴν ὕλην, ὡσπερ ἐλέχθη καὶ πρότερον, ὡστε αὐτομάτην μεταβλαστάνειν μεταβολῆς τινος γινομένης ἐκ τῶν οὐρανίων τοιαύτης. τὰ μὲν οὖν περὶ τὰς γενέσεις καὶ μεταβολὰς ἐκ τούτων θεωρητέον.

V. Ἐπεὶ δὲ καὶ αἱ ἐργασίαι καὶ αἱ θεραπείαι μεγάλα συμβάλλονται, καὶ ἔτι πρότερον αἱ φυτεῖαι καὶ ποιοῦσι μεγάλας διαφοράς, λεκτέον καὶ περὶ τούτων.

Καὶ πρῶτον περὶ τῶν φυτειῶν. αἱ μὲν οὖν ὥραι πρότερον εἴρηνται καθ' ἄς δεῖ. τὰ δὲ φυτὰ λαμβάνειν κελεύονται ως κάλλιστα καὶ ἐξ ὅμοίας γῆς εἰς ἦν μέλλεις φυτεύειν, ἡ χείρονος· τοὺς δὲ γυροὺς προορύττειν ως πλείστου χρόνου καὶ βαθυτέρους αἰεὶ καὶ τοῖς ἐπιπολαιορριζοτέροις.

¹ i.e. in the instance given the development of an insect exhibits, not one, but a series of changes from one creature to another.

² Whereas the metamorphoses mentioned above are independent of climatic conditions.

³ δὲ conj. W.; τε Ald.

⁴ κάλλιστα conj. W., cf. C.P. 3. 24. 1; τάχιστα MVAld.; τὰ χίστα U.

dry up. Most obvious are certain changes in regard to the way in which animals are produced, and such changes run through a series of creatures¹; thus a caterpillar changes into a chrysalis, and this in turn into the perfect insect; and the like occurs in a number of other cases. But there is hardly anything abnormal in this, nor is the change in plants, which is the subject of our enquiry, analogous to it. That kind of change occurs in trees and in all woodland plants generally, as was said before, and its effect is that, when a change of the required character occurs in the climatic conditions, a spontaneous change in the way of growth ensues.² These instances must suffice for investigation of the ways in which plants are produced or modified.

Of methods of propagation, with notes on cultivation.

V. Since however methods of cultivation and tendency largely contribute, and, before these, methods of planting, and cause great differences, of these too we must speak.

And first of methods of planting: as to the seasons, we have already stated at what seasons one should plant. Further³ we are told that the plants chosen should be the best possible,⁴ and should be taken from soil resembling that in which you are going to plant them, or else inferior⁵; also the holes should be dug⁶ as long as possible beforehand, and should always be deeper than the original holes, even for those whose roots do not run very deep.

⁶ i.e. the shift should be into better soil, if possible. cf. C.P. 3. 5. 2.

⁶ γυρούς προσορύττειν conj. R. Const.; πυρούς προσορύττειν UMVAld. cf. C.P. 3. 4. 1.

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2 Λέγουσι δέ τινες ώς οὐδεμία κατωτέρω διϊκνεῖται τριῶν ἡμιποδίων· δι' ὃ καὶ ἐπιτιμῶσι τοῖς ἐν μείζονι βάθει φυτεύουσιν· οὐκ ἐοίκασι δὲ ὄρθως λέγειν ἐπὶ πολλῶν· ἀλλ' ἐὰν ἡ χώματος ἐπιλάβηται βαθέος ἡ καὶ χώρας τοιαύτης ἡ καὶ τόπου, πολλῷ μακροτέραν ὥθει τὸ τῇ φύσει βαθύρριζον. πεύκην δέ τις ἔφη μεταφυτεύων μεμοχλευμένην μείζω τὴν ρίζαν ἔχειν ὀκτάπηχυν καίπερ οὐχ ὅλης ἔξαιρεθείσης ἀλλ' ἀπορραγείσης.

3 Τὰ δὲ φυτευτήρια ἐὰν μὲν ἐνδέχηται ὑπόρριζα, εἰ δὲ μή, δεῖ μᾶλλον ἀπὸ τῶν κάτω ἡ τῶν ἄνω λαμβάνειν, πλὴν ἀμπέλου· καὶ τὰ μὲν ἔχοντα ρίζας ὄρθδα ἐμβάλλειν, τὰ δὲ μὴ ἔχοντα ὑποβάλλειν τοῦ φυτευτηρίου ὅσον σπιθαμὴν ἡ μικρῷ πλεῖον. ἔνιοι δὲ κελεύουσι καὶ τῶν ὑπορρίζων ὑποβάλλειν, τιθέναι δὲ καὶ τὴν θέσιν ὁμοίως ἥνπερ εἶχεν ἐπὶ τῶν δένδρων τὰ πρόσβορρα καὶ τὰ πρὸς ἔω καὶ τὰ πρὸς μεσημβρίαν. ὅσα δὲ ἐνδέχεται τῶν φυτῶν καὶ προμοσχεύειν· τὰ μὲν ἐπ' αὐτῶν τῶν δένδρων, οἷον ἐλάσας ἀπίου μηλέας συκῆς· τὰ δ' ἀφαιροῦντας, οἷον ἀμπέλου· ταύτην γὰρ οὐχ οἷόν τε ἐπ' αὐτῆς μοσχεύειν.

4 Ἐὰν δὲ μὴ ὑπόρριζα τὰ φυτὰ μηδὲ ὑπόπρεμνα

¹ ἀλλ' ἐὰν . . . τοιούτου. ἐὰν ἡ μὲν σώματος M; so V, but ³; ἡ om. PAld.; χώματος H; κενώματος for σώματος and εὐδιόδου for ἡ καὶ τόπου conj. W. χώρας refers to exposure, etc., τόπου (sc. τοιούτου) to quality of soil: so G.

² Plin. 16. 129; Xen. Oec. 19. 3. ³ cf. C.P. 3. 6.

Some say that no root goes down further than a foot and a half, and accordingly they blame those who plant deeper. However there are many instances in which it appears that what they say does not hold good; a plant which is naturally deep-rooting pushes much deeper if it finds either a deep mass of soil or a position which favours such growth or again the kind of ground which favours it.¹ In fact,² a man once said that when he was transplanting a fir which he had uprooted with levers, he found that it had a root more than eight cubits long, though the whole of it had not been removed, but it was broken off.

The slips for planting should be taken, if possible, with roots attached, or, failing that, from the lower³ rather than from the higher parts of the tree, except in the case of the vine; those that have roots should be set upright,⁴ while in the case of those which have none about⁵ a handsbreadth or rather more of the slip should be buried. Some say that part even of those which have roots should be buried, and that the position⁶ should be the same as that of the tree from which the slip was taken, facing north or east or south, as the case may be. With those plants with which it is possible, shoots from the boughs should also, they say, be planted, some being set on the trees themselves,⁷ as with olive pear apple and fig, but in other cases, as in that of the vine, they must be set separately, for that the vine cannot be grafted on itself.

If the slips cannot be taken with root or stock

⁴ cf. C.P. 3. 6. 4; Xen. *Oec.* 19. 9.

⁵ δορν conj. Sch.; ολων P₂Ald.

⁶ cf. C.P. 3. 5. 2. ⁷ i.e. grafted.

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λαμβάνειν, καθάπερ τῆς ἐλάας, σχίσαντά τε τὸ
ξύλον κάτωθεν καὶ λίθον ἐμβαλόντα φυτεύειν·
όμοιώς δὲ καὶ τῆς ἐλάας καὶ συκῆς καὶ τῶν ἄλ-
λων. φυτεύεται δὲ ἡ συκῆ καὶ ἐάν τις κράδην
παχεῖαν ἀποξύνας σφύρᾳ παίῃ, ἄχρι οὐδὲ ἀν
ἀπολίπη μικρὸν ὑπὲρ τῆς γῆς, εἰτ' αὐτῆς ἄμμον
βαλὼν ἄνωθεν ἐπιχώσῃ· καὶ γίνεσθαι δή φασι
καὶ καλλίω ταῦτα τὰ φυτά, μέχρι οὐδὲ ἡ
νέα.

5 Παραπλησία καὶ τῶν ἀμπέλων, ὅταν ἀπὸ
τοῦ παττάλου προοδοποιεῖ γὰρ ὁ πάτταλος
ἐκείνῳ τῷ κλήματι διὰ τὴν ἀσθένειαν· φυ-
τεύουσιν οὖτω καὶ ρόαν καὶ ἄλλα τῶν δένδρων.
ἡ συκῆ δέ, ἐὰν ἐν σκίλλῃ φυτευθῇ, θάττον παρα-
γίνεται καὶ ἡττον ὑπὸ σκωλήκων κατεσθίεται.
ὅλως δὲ πᾶν ἐν σκίλλῃ φυτευόμενον εὐβλαστὲς
καὶ θάττον αὐξάνεται. ὅσα δὲ ἐκ τοῦ στελέχους
καὶ διακοπτόμενα φυτεύεται, κάτω τρέποντα τὴν
τομὴν δεῖ φυτεύειν, διακόπτειν δὲ μὴ ἐλάττω
σπιθαμιαίων, ὥσπερ ἐλέχθη, καὶ τὸν φλοιὸν
προσεῖναι· φύεται δὲ ἐκ τῶν τοιούτων ἔρυν· βλα-
στανόντων δὲ ἀεὶ προσχωννύειν, ἄχρι οὐδὲ ἀν γένη-
ται ἄρτιον· αὕτη μὲν οὖν τῆς ἐλάας ἴδια καὶ τοῦ
μυρρίνου, αἱ δὲ ἄλλαι κοινότεραι πᾶσιν.

6 Ἀριστον δὲ καὶ ρίζώσασθαι καὶ φυτείας μάλι-
στα τῆς τυχούσης ἡ συκῆ. φυτεύειν δὲ ρόας μὲν

¹ ἡ before τῆς om. W. ² τε τὸ conj. W.; τό τε MVP.

³ καὶ τῆς ἐλαῖας U; ἐλάας MVP; so W.

⁴ Plin. 17, 123. ⁵ cf. C.P. 3. 12. 1.

⁶ cf. 7. 13. 4; C.P. 5. 6. 10 (where another bulb, σχῖνος, is
mentioned as being put to the same use); Athen. 3. 13;
Plin. 17. 87.

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attached, as with the olive,¹ they say that one must² split the wood at the lower end and plant with a stone on top; and the fig and other trees must be treated in like manner with the olive.³ The fig⁴ is also propagated by sharpening a stout shoot and driving it in with a hammer, till only a small piece of it is left above ground, and then piling sand above so as to earth it up; and they say that the plants thus raised grow finer up to a certain age.

Similar is the method used with vines, when they are propagated by the 'peg'⁵ method; for the peg makes a passage for that sort of shoot on account of its weakness; and in the same manner men plant the pomegranate and other trees. The fig progresses more quickly and is less eaten by grubs, if the cutting is set in a squill-bulb⁶; in fact anything so planted is vigorous and grows faster. All those trees which are propagated by pieces cut from the stem should be planted with the cut part downwards,⁷ and the pieces cut off should not be less than a handsbreadth in length, as was said,⁸ and the bark should be left on. From such pieces new shoots grow, and as they grow, one should keep on heaping up earth about them, till the tree becomes strong.⁹ This kind of propagation is peculiar to the olive and myrtle, while the others are more or less common to all trees.

The fig is better than any other tree at striking roots, and will, more than any other tree, grow by any method of propagation.¹⁰ We are told that,

⁷ cf. *Geop.* 9. 11. 8.

⁸ 2. 5. 3, where however the method of propagation is different.

⁹ ἄρτιον Ald.; ἄρτιτελῆ conj. W. (*quoad satis corroboretur* G; *donec robur planta capiat* Plin. 17. 124); ἄρτιτεων U; ἄρτιτέων MV; ἄρτιτέων P₂. ¹⁰ cf. *C.P.* 3. 7.

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καὶ μυρρίνους καὶ δάφνας πυκνὰς κελεύουσι, μὴ πλέον διεστώσας ἡ ἐννέα πόδας, μηλέας δὲ μικρῷ μακρότερον, ἀπίους δὲ καὶ συκᾶς πολλῷ πλέον, ὡσαύτως δὲ καὶ τὴν ἐλάαν. ποιεῖσθαι δὲ καὶ πρὸς τὸν τόπον τὰς ἀποστάσεις· ἐν γὰρ τοῖς ὁρεινοῖς ἐλάττους ἡ ἐν τοῖς πεδεινοῖς.

7 Μέγιστον δὲ ὡς εἰπεῖν τὸ τὴν πρόσφορον ἐκάστῳ χώρᾳ ἀποδιδόναι· τότε γὰρ εὐθενεῖ μάλιστα. ὡς δ' ἀπλῶς εἰπεῖν ἐλάᾳ μὲν καὶ συκῇ καὶ ἀμπέλῳ τὴν πεδεινήν φασιν οἰκειοτάτην εἶναι, τοῖς δὲ ἀκροδρύοις τὰς ὑπωρείας. χρὴ δὲ καὶ ἐν αὐτοῖς τοῖς ὁμογενέσι μὴ ἀγνοεῖν τὰς οἰκείας. ἐν πλείστῃ δὲ ὡς εἰπεῖν διαφορὰ τὰ τῶν ἀμπέλων ἔστιν ὅσα γάρ ἔστι γῆς εἴδη, τοσαῦτά τινές φασι καὶ ἀμπέλων εἶναι. φυτευόμενα μὲν οὖν κατὰ φύσιν ἀγαθὰ γίνεσθαι παρὰ φύσιν δὲ ἄκαρπα. ταῦτα μὲν οὖν ὕσπερ κοινὰ πάντων.

VI. Τῶν δὲ φοινίκων ἕδιος ἡ φυτεία παρὰ τάλλα καὶ ἡ μετὰ ταῦτα θεραπεία. φυτεύουσι γὰρ πλείους εἰς ταύτο τιθέντες δύο κάτω καὶ δύο ἄνωθεν ἐπιδοῦντες, πραινεῖς δὲ πάντας. τὴν γὰρ ἔκφυσιν οὐκ ἐκ τῶν ὑπτίων καὶ κοῖλων ποιεῖται, καθάπερ τινές φασιν, ἀλλ' ἐκ τῶν ἄνω, δι' ὃ καὶ ἐν τῇ ἐπιζεύξει τῶν ἐπιτιθεμένων οὐ δεῖ περικαλύπτειν τὰς ἀρχὰς ὅθεν ἡ ἔκφυσις· φανερὰὶ δ'

¹ ἐλάαν conj. Bod. (cf. Plin. 17. 88); ροιάν U Ald. H.

² ἐλάττονι conj. Sch.; ἐλαττον Ald.

³ i.e. apples pears plums, etc.

in planting the pomegranate myrtle or bay, one should set two trees close together, not further than nine feet apart, apples a little further, pears and wild pears still further, almonds and figs further still, and in like manner the olive.¹ Again the distance apart must be regulated by the nature of the ground, being less² in hilly parts than in low ground.

Most important of all, one may say, is it to assign to each the suitable soil; for then is the tree most vigorous. Speaking generally, they say that low ground is most suitable for the olive fig and vine, and the lower slopes of hills for fruit trees.³ Nor should one fail to note what soil suits each variety even of those closely related. There is the greatest difference, one may say, between the different kinds of vine: for they say that there are as many kinds of vine as there are of soil. If they are planted as their nature requires, they turn out well, if otherwise, they are unfruitful. And these remarks apply almost equally to all trees.

Of the propagation of the date-palm; of palms in general.

VI. ⁴ The method of propagating date-palms is peculiar and exceptional, as also is their subsequent cultivation. They plant several seeds together, putting two below and two above, which are fastened on; but all face downwards.⁵ For germination starts not, as some say, from the 'reverse' or hollow side,⁶ but from the part⁷ which is uppermost; wherefore in joining on the seeds which are placed above one must not cover up the points from which the growth

⁴ Plin. 13. 32.

⁵ i.e. with the grooved side downwards.

⁶ i.e. the grooved side. ⁷ i.e. the round side.

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εἰσὶ τοῖς ἐμπείροις. διὰ τοῦτο δὲ εἰς τὸ αὐτὸ πλείους τιθέασιν ὅτι ἀπὸ τοῦ ἐνὸς ἀσθενῆς ἡ φυτεία. τούτων δὲ αὖτε ρίζαι πρὸς ἀλλήλας συμπλέκονται καὶ εὐθὺς αἱ πρώται βλαστήσεις, ὥστε ἐν γίνεσθαι τὸ στέλεχος.

2 Ἡ μὲν οὖν ἀπὸ τῶν καρπῶν φυτεία τοιαύτη τις· ἡ δὲ ἀφ' αὐτοῦ, ὅταν ἀφέλωσι τὸ ἄνω ἐν ϕῷ περ ὁ ἐγκέφαλος· ἀφαιροῦσι δὲ ὅσον δίπηχυ· σχίσαντες δὲ τοῦτο κάτω τιθέασι τὸ ὑγρόν· φιλεῖ δὲ χώραν ἀλμώδη· δι' ὃ καὶ ὅπου μὴ τοιαύτη τυγχάνει περιπάτουσιν ἄλας οἱ γεωργοί· τοῦτο δὲ δεῖ ποιεῖν μὴ περὶ αὐτὰς τὰς ρίζας ἀλλ' ἀποθεν ἀποστήσαντα περιπάττειν ὅσον ἡμίεκτον· ὅτι δὲ τοιαύτην ζητεῖ χώραν κάκεῦνο ποιοῦνται σημεῖον· πανταχοῦ γὰρ ὅπου πλῆθος φοινίκων ἀλμώδεις αἱ χῶραι· καὶ γὰρ ἐν Βαβυλῶνί φασιν, ὅπου οἱ φοινικες πεφύκασι, καὶ ἐν Λιβύῃ δὲ καὶ ἐν Αἰγύπτῳ καὶ Φοινίκῃ καὶ τῆς Συρίας δὲ τῆς κοιλῆς, ἐν ᾧ γ' οἱ πλεῖστοι τυγχάνουσιν, ἐν τρισὶ μόνοις τόποις ἀλμώδεσιν εἶναι τοὺς δυναμένους θησαυρίζεσθαι· τοὺς δὲ ἐν τοῖς ἄλλοις οὐ διαμένειν ἀλλὰ σήπεσθαι, χλωροὺς δὲ ἡδεῖς εἶναι καὶ καταναλίσκειν οὕτω.

3 Φιλεῖ δὲ καὶ ὑδρείαν σφόδρα τὸ δένδρον· περὶ δὲ κόπρου διαμφισθητοῦσιν· οἱ μὲν γὰρ οὐ φασι χαίρειν ἀλλ' ἐναντιώτατον εἶναι, οἱ δὲ καὶ χρῆσθαι καὶ ἐπίδοσιν πολλὴν ποιεῖν. δεῖν δὲ ὑδρεύειν εὐ μάλα κατὰ τῆς κόπρου, καθάπερ οἱ ἐν

¹ i.e. 'cabbage.'

² τοῦτο . . . ὑγρόν: I have inserted δὲ, otherwise retaining the reading of Ald.; τούτου κάτω· τιθέασι δὲ ξυνγρον conj. W. cf. Plin. 13. 36. τὸ ὑγρόν, viz. the cut end.

³ ἀλμώδη conj. W.; ἀμμώδη P₂Ald.H.

ENQUIRY INTO PLANTS, II. VI. 1-3

is to come; and these can be recognised by experts. And the reason why they set several together is that a plant that grows from one only is weak. The roots which grow from these seeds become entangled together and so do the first shoots from the very start, so that they combine to make a single stem.

Such is the method of growing from the fruits. But propagation is also possible from the tree itself, by taking off the top, which contains the 'head.'¹ They take off about two cubits' length, and, splitting it, set the moist end.² It likes a soil which contains salt³; wherefore, where such soil is not available, the growers sprinkle salt about it; and this must not be done about the actual roots: one must keep the salt some way off and sprinkle about a gallon. To shew that it seeks such a soil they offer the following proof; wherever date-palms grow abundantly, the soil is salt,⁴ both in Babylon, they say, where the tree is indigenous, in Libya in Egypt and in Phoenicia; while in Coele-Syria, where are⁵ most palms, only in three districts, they say, where the soil is salt, are dates produced which can be stored; those that grow in other districts do not keep, but rot, though when fresh they are sweet and men use⁶ them at that stage.

⁷ The tree is likewise very fond of irrigation; as to dung there is a difference of opinion: some say that the date-palm does not like it, but that it is most injurious, others that it gladly accepts⁸ it and makes good growth thereby, but plenty of water should be

¹ ἀλμάθεις conj. W.; ἀμμάθεις Ald. H.

² ἐν δὲ γ' οἱ conj. W.; τι' Ἰνδοι U; ἡν 'Ινδοι MVAld.

³ καταναλίσκειν Ald.; καταναλίσκεσθαι conj. W.

⁷ Plin. 13. 28.

⁸ καὶ χρῆσθαι conj. Sch.; κεχρῆσθαι Ald.; ? κεχάρησθαι.

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‘Ρόδῳ. τοῦτο μὲν οὖν ἐπισκεπτέον· ἵσως γὰρ οἱ μὲν οὔτως οἱ δὲ ἐκείνως θεραπεύουσιν, καὶ μετὰ μὲν τοῦ ὕδατος ὡφέλιμον ἡ κόπρος ἄνευ δὲ τούτου βλαβερά. ὅταν δὲ ἐνιαύσιος γένηται, μεταφυτεύουσι καὶ τῶν ἄλλων συμπαραβάλλουσι, καὶ πάλιν ὅταν διετής χαίρει γὰρ σφόδρα τῇ μεταφυτείᾳ.

4 Μεταφυτεύουσι δὲ οἱ μὲν ἄλλοι τοῦ ἥρος· οἱ δὲ ἐν Βαβυλῶνι περὶ τὸ ἄστρον, ὅτε καὶ ὅλως οἴ γε πολλοὶ φυτεύουσιν, ὡς καὶ παραγινομένου καὶ αὐξανομένου θάττου. νέου μὲν ὅντος οὐχ ἄπονται, πλὴν ἀναδούσι τὴν κόμην, ὅπως ὁρθοφυῇ τῇ⁷ καὶ αἱ ράβδοι μὴ ἀπαρτῶνται. μετὰ δὲ ταῦτα περιτέμνουσιν, ὅπόταν ἀδρὸς ἥδη γένηται καὶ πάχος ἔχῃ. ἀπολείπουσι δὲ ὅσον σπιθαμὴν τῶν ράβδων. φέρει δὲ ἔως μὲν ἀν ἡ νέος ἀπύρηνον τὸν καρπόν, μετὰ δὲ τοῦτο πυρηνώδη.

5 Ἄλλοι δέ τινες λέγουσιν ὡς οἴ γε κατὰ Συρίαν οὐδεμίαν προσάγουσιν ἐργασίαν ἀλλ’ ἡ διακαθαίρουσι καὶ ἐπιβρέχουσιν, ἐπιζητεῖν δὲ μᾶλλον τὸ ναματιαῖον ὕδωρ ἡ τὸ ἐκ τοῦ Διός· εἰναι δὲ πολὺ τοιοῦτον ἐν τῷ αὐλῶνι ἐν ὧ καὶ τὰ φοινικόφυτα τυγχάνει, τὸν αὐλῶνα δὲ τοῦτον λέγειν τοὺς Σύρους ὅτι διατείνει διὰ τῆς Ἀραβίας μέχρι τῆς ἐρυθρᾶς θαλάσσης καὶ πολλοὺς φάσκειν ἐληλυθέναι τούτου δὲ ἐν τῷ κοιλοτάτῳ πεφυκέναι τοὺς φοίνικας. ταῦτα μὲν οὖν τάχ’ ἀμφοτέρως ἀν εἴη· κατὰ γὰρ τὰς χώρας, ὥσπερ καὶ

¹ cf. 7. 5. 1.

² Plin. 13. 37.

³ συμπαραβάλλουσι conj. Sch. from G; συμπαραβάλλουσι U Ald.

⁴ cf. Plin. 13. 38.

ENQUIRY INTO PLANTS, II. vi. 3-5

given, after manuring, as the Rhodians use. This then is matter for enquiry ; it may be that there are two distinct methods of cultivation, and that dung, if accompanied by watering,¹ is beneficial, though without it it is harmful. ² When the tree is a year old, they transplant it and give plenty ³ of salt, and this treatment is repeated when it is two years old, for it delights greatly in being transplanted.

⁴ Most transplant in the spring, but the people of Babylon about the rising of the dog-star, and this is the time when most people propagate it, since it then germinates and grows more quickly. As long as it is young, they do not touch it, except that they tie up the foliage, so that it may grow straight⁵ and the slender branches may not hang down.⁶ At a later stage they prune it, when it is more vigorous and has become a stout tree, leaving the slender branches only about a handsbreadth long. So long as it is young, it produces its fruit without a stone, but later on the fruit has a stone.

However some say that the people of Syria use no cultivation, except cutting out wood and watering, also that the date-palm requires spring water rather than water from the skies ; and that such water is abundant in the valley in which are the palm-groves. And they add that the Syrians say that this valley⁷ extends through Arabia to the Red Sea,⁸ and that many profess to have visited it,⁹ and that it is in the lowest part of it that the date-palms grow. Now both accounts may be true, for it is not strange that

⁵ ὀρθοφυῆ τ' ή conj. W.; ὀρθοφύηται P₂Ald.

⁶ ἀπαρτῶνται conj. R. Const.; ἀπορθῶνται P₂M Ald.

⁷ cf. Diod. 3. 41.

⁸ i.e. the Arabian Gulf.

⁹ έληλυθένται Ald.; διεληλυθένται conj. W.

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αὐτὰ τὰ δένδρα, διαφέρειν καὶ τὰς ἐργασίας οὐκ ἄτοπον.

6 Γένη δὲ τῶν φοινίκων ἔστι πλείω πρῶτον μὲν καὶ ὕσπερ ἐν μεγίστῃ διαφορᾷ τὸ μὲν κάρπιμον τὸ δὲ ἄκαρπον, ἐξ ὧν οἱ περὶ Βαβυλῶνα τάς τε κλίνας καὶ τάλλα σκεύη ποιοῦνται. ἔπειτα τῶν καρπίμων οἱ μὲν ἄρρενες αἱ δὲ θήλειαι διαφέρουσι δὲ ἀλλήλων, καθ' ἀ ὁ μὲν ἄρρην ἄνθος πρῶτον φέρει ἐπὶ τῆς σπάθης, ἡ δὲ θήλεια καρπὸν εὐθὺν μικρόν. αὐτῶν δὲ τῶν καρπῶν διαφορὰ πλείους οἱ μὲν γὰρ ἀπύρηνοι οἱ δὲ μαλακοπύρηνοι· τὰς χροιὰς οἱ μὲν λευκοὶ οἱ δὲ μέλανες οἱ δὲ ξανθοί· τὸ δ' δλον οὐκ ἐλάττω χρώματά φασιν εἶναι τῶν συκῶν οὐδὲ ἀπλῶς τὰ γένη διαφέρειν δὲ καὶ κατὰ τὰ μεγέθη καὶ κατὰ τὰ σχήματα· καὶ γὰρ σφαιροειδεῖς ἐνίους ὡσανεὶ μῆλα καὶ τὰ μεγέθη τηλικούτους ὡς τέτταρας εἰς τὸν πῆχυν εἶναι, [ἔπτα καὶ εὐπόδους]; ἄλλους δὲ μικροὺς ἡλίκους ἐρεβίνθους. καὶ τοῖς χυλοῖς δὲ πολὺ διαφέροντας.

7 Κράτιστον δὲ καὶ τῶν λευκῶν καὶ τῶν μελάνων τὸ βασιλικὸν καλούμενον γένος ἐν ἑκατέρῳ καὶ μεγέθει καὶ ἀρετῇ· σπάνια δὲ εἶναι ταῦτα λέγουσι· σχεδὸν γὰρ ἐν μόνῳ τῷ Βαγώου κήπῳ τοῦ παλαιοῦ περὶ Βαβυλῶνα. ἐν Κύπρῳ δὲ ἵδιόν τι γένος φοινίκων ἔστιν δὲ οὐ πεπαίνει τὸν καρπόν, ἀλλ' ὡμὸς ὧν ἡδὺς σφόδρα καὶ γλυκύς ἔστι· τὴν δὲ γλυκύτητα ἴδιαν ἔχει. ἔνιοι δὲ οὐ μόνον δια-

¹ Plin. 13. 39.

² πρῶτον conj. Sch.; πρῶτος UMVAld.

³ πῆχυν conj. R. Const. from Plin. 13. 45. and G, cf. Diod. 2. 53; στάχυν UMVAld.

⁴ ἔπτα καὶ εὐπόδους UMV: the words perhaps conceal a

in different soils the methods of cultivation should differ, like the trees themselves.

¹ There are several kinds of palm. To begin with, to take first the most important difference;—some are fruitful and some not; and it is from this latter kind that the people of Babylon make their beds and other furniture. Again of the fruitful trees some are ‘male,’ others ‘female’; and these differ from one another in that the ‘male’ first² bears a flower on the spathe, while the ‘female’ at once bears a small fruit. Again there are various differences in the fruits themselves; some have no stones, others soft stones; as to colour, some are white, some black, some yellow; and in general they say that there is not less variety of colour and even of kind than in figs; also that they differ in size and shape, some being round like apples and of such a size that four of them make up a cubit³ in length, . . .⁴ while others are small,⁵ no bigger than chick-peas; and that there is also much difference in flavour.

The best kind alike in size and in quality, whether of the white or black variety, is that which in either form is called ‘the royal palm’; but this, they say, is rare; it grows hardly anywhere except in the park of the ancient Bagoas,⁶ near Babylon. In Cyprus⁷ there is a peculiar kind of palm which does not ripen its fruit, though, when it is unripe, it is very sweet and luscious, and this lusciousness is of a peculiar kind. Some palms again⁸ differ not merely

gloss on *πῆχυν*, e.g. *εἰς πῆχυν δύο πόδες* (Salm.); om. G; *ἐντοτε καὶ ἐπὶ πόδα* conj. W. ⁵ Plin. 13. 42.

⁶ *Βαγφού*: *Βάττου* MSS. corr. by R. Const. from Plin. 13. 41. *τοῦ παλαιοῦ* apparently distinguishes this Bagoas from some more recent wearer of the name.

⁷ Plin. 13. 33. ⁸ Plin. 13. 28.

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φέρουσι τοῖς καρποῖς ἀλλὰ καὶ αὐτῷ τῷ δένδρῳ
κατά τε τὸ μῆκος καὶ τὴν ἄλλην μορφήν· οὐ γάρ
μεγάλοι καὶ μακροὶ ἀλλὰ βραχεῖς, ἔτι δὲ καρπι-
μώτεροι τῶν ἄλλων καὶ καρποφοροῦντες εὐθὺς
τριετεῖς· πολλοὶ δὲ καὶ οὗτοι περὶ Κύπρου. εἰσὶ¹
δὲ καὶ περὶ Συρίαν καὶ περὶ Αἴγυπτου φοίνικες
οὐ φέρουσι τετραετεῖς καὶ πενταετεῖς ἀνδρομήκεις
δύντες.

8 "Ἐτερον δ' ἔτι γένος ἐν Κύπρῳ, δὲ καὶ τὸ φύλλον
πλατύτερον ἔχει καὶ τὸν καρπὸν μείζω πολλῷ
καὶ ἴδιόμορφον" μεγέθει μὲν ἡλίκος ρόα τῷ σχή-
ματι δὲ προμήκης, οὐκ εὔχυλος δὲ ὥσπερ ἄλλοι
ἄλλ' ὅμοιος ταῖς ρόαις, ὥστε μὴ καταδέχεσθαι
ἄλλα διαμασησαμένους ἐκβάλλειν. γένη μὲν οὖν,
ὥσπερ εἴρηται, πολλά. θησαυρίζεσθαι δὲ μόνους
δύνασθαι φασὶ τῶν ἐν Συρίᾳ τοὺς ἐν τῷ αὐλῶνι,
τοὺς δὲ ἐν Αἴγυπτῳ καὶ Κύπρῳ καὶ παρὰ τοῖς
ἄλλοις χλωροὺς ἀναλίσκεσθαι.

9 "Ἐστι δὲ ὁ φοῖνιξ ὡς μὲν ἀπλῶς εἰπεῖν μονο-
στέλεχες καὶ μονοφυές· οὐ μὴν ἀλλὰ γίνονται
τινες καὶ διφυεῖς, ὥσπερ ἐν Αἴγυπτῳ, καθάπερ
δικρόαν ἔχοντες· τὸ δὲ ἀνάστημα τοῦ στελέχους
ἀφ οὐ ή σχίσις καὶ πεντάπηχον πρὸς ἄλληλα δέ
πως ἴσάζοντα. φασὶ δὲ καὶ τοὺς ἐν Κρήτῃ
πλείους εἶναι τοὺς διφυεῖς, ἐνίους δὲ καὶ τριφυεῖς·
ἐν δὲ τῇ Λαπαιά τινὰ καὶ πεντακέφαλον· οὐκ
ἄλογον γοῦν ἐν ταῖς εὐτροφωτέραις χώραις πλείω
γίνεσθαι τὰ τοιαῦτα καὶ τὸ ὅλον δὲ τὰ εἴδη πλείω
καὶ τὰς διαφοράς.

¹ δμοιος conj. Bod.; δμοιως UΜVAlD.

² cf. § 5.

* Plin. 13. 38; cf. 4. 2. 7, where the name (*κουκιόφορον*) of
this tree is given.

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in their fruits but in the character of the tree itself as to stature and general shape ; for instead of being large and tall they are low growing ; but these are more fruitful than the others, and they begin to bear as soon as they are three years old ; this kind too is common in Cyprus. Again in Syria and Egypt there are palms which bear when they are four or five years old, at which age they are the height of a man.

There is yet another kind in Cyprus, which has broader leaves and a much larger fruit of peculiar shape ; in size it is as large as a pomegranate, in shape it is long ; it is not however juicy like others, but like¹ a pomegranate, so that men do not swallow it, but chew it and then spit it out. Thus, as has been said, there are many kinds. The only dates that will keep, they say, are those which grow in the Valley² of Syria, while those that grow in Egypt Cyprus and elsewhere are used when fresh.

The palm, speaking generally, has a single and simple stem ; however there are some with two stems, as in Egypt,³ which make a fork, as it were ; the length of the stem up to the point where it divides is as much as five cubits, and the two branches of the fork are about equal in length. They say that the palms in Crete more often than not have this double stem, and that some of them have three stems ; and that in Lapaia one with five heads has been known. It is after all not surprising⁴ that in more fertile soils such instances should be commoner, and in general that more kinds and more variation should be found under such conditions.

¹ οὐκ ἀλογον γοῦν conj. W. (οὐκ ἀλογον δ' Sch.) ; οὐ καλῶς γοῦν Ald. MU (marked doubtful).

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10 "Αλλο δέ τι γένος ἔστιν ὁ φασι γίνεσθαι πλείστου περὶ τὴν Αἰθιοπίαν, ὁ καλούσι κόϊκας· οὗτοι δὲ θαμνώδεις, οὐχὶ ἐν τὸ στέλεχος ἔχοντες ἀλλὰ πλείω καὶ ἐνίστε συνηρτημένα μέχρι τινὸς εἰς ἔν, τὰς δὲ ράβδους οὐ μακρὰς μὲν ἀλλ' ὅσουν πηχυαίας, ἀλλὰ λείας, ἐπὶ δὲ τῶν ἄκρων τὴν κόμην. ἔχουσι δὲ καὶ τὸ φύλλον πλατὺ καὶ ὕσπερ ἐκ δυοῖν συγκείμενον ἐλαχίστοιν. καλοὶ δὲ καὶ τῇ ὅψει φαίνονται· τὸν δὲ καρπὸν καὶ τῷ σχήματι καὶ τῷ μεγέθει καὶ τῷ χυλῷ διάφορον ἔχουσι· στρογγυλώτερον γὰρ καὶ μείζω καὶ εὐστομώτερον ἥττον δὲ γλυκύν. πεπαίνουσι δὲ ἐν τρισὶν ἔτεσιν ὕστ' ἀεὶ καρπὸν ἔχειν, ἐπικαταλαμβάνοντος τοῦ νέου τὸν ἔνον· ποιοῦσι δὲ καὶ ἄρτους ἐξ αὐτῶν· περὶ μὲν οὖν τούτων ἐπισκεπτέον.

11 Οἱ δὲ χαμαιρριφεῖς καλούμενοι τῶν φοινίκων ἔτερόν τι γένος ἔστιν ὕσπερ ὁμώνυμον· καὶ γὰρ ἐξαιρεθέντος τοῦ ἐγκεφάλου ζῶσι καὶ κοπέντες ἀπὸ τῶν ρέζῶν παραβλαστάνουσι. διαφέρουσι δὲ καὶ τῷ καρπῷ καὶ τοῖς φύλλοις· πλατὺ γὰρ καὶ μαλακὸν ἔχουσι τὸ φύλλον, δι' ὃ καὶ πλέκουσιν ἐξ αὐτοῦ τάς τε σπυρίδας καὶ τοὺς φορμούς· πολλοὶ δὲ καὶ ἐν τῇ Κρήτῃ γίνονται καὶ ἔτι μᾶλλον ἐν Σικελίᾳ. ταῦτα μὲν οὖν ἐπὶ πλείον εἴρηται τῆς ὑποθέσεως.

¹ Plin. 13. 47.

² κόϊκας conj. Salm. cf. 1. 10. 5, and the probable reading in Plin. l.c.

³ συνηρτημένα μέχρι τινὸς εἰς ἔν conj. W.; συνηρτημένας μὲν

ENQUIRY INTO PLANTS, II. VI. 10-11

¹ There is another kind which is said to be abundant in Ethiopia, called the doum-palm²; this is a shrubby tree, not having a single stem but several, which sometimes are joined together up to a certain point³; and the leaf-stalks are not long,⁴ only the length of a cubit, but they are plain,⁵ and the leafage is borne only at the tip. The leaf is broad and, as it were, made up of at least⁶ two leaflets. This tree is fair to look upon, and its fruit in shape size and flavour differs from the date, being rounder larger and pleasanter to the taste, though not so luscious. It ripens in three years, so that there is always fruit on the tree, as the new fruit overtakes that of last year. And they make bread out of it. These reports then call for enquiry.

⁷ The dwarf-palm, as it is called, is a distinct kind, having nothing but its name⁸ in common with other palms. For if the head is removed, it survives, and, if it is cut down, it shoots again from the roots. It differs too in the fruit and leaves; for the leaf is broad and flexible, and so they weave their baskets and mats out of it. It is common in Crete and still more so in Sicily.⁹ However in these matters we have said more than our purpose required.

εἰς ἐν U; *συνηρημένα μέχρι τινὸς εἰσι* Ald.; *συνηρημένας μὲν μέχρι τινὸς εἰσι* MV.

⁴ *μὲν* ins. W. after Sch. (omitted above).

⁵ i.e. without leaflets, except at the tip.

⁶ *ἐλαχίστοιν* Bas.; *ἐλαχίστων* U. cf. Arist. *Eth. N.* 5. 3. 3, *ἐν ἐλαχίστοις δυσίν.*

⁷ Plin. 13. 39. ⁸ For *δμώνυμον* cf. 9. 10. 1 n.

⁹ A dwarf palm is now abundant at Selinunte: cf. Verg. *Aen.* 3. 705, *palmosa Selinus.*

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12 Ἐν δὲ ταῖς τῶν ἄλλων φυτείαις ἀνάπαλιν τίθενται τὰ φυτευτήρια, καθάπερ τῶν κλημάτων. οἱ μὲν οὖν οὐθὲν διαφέρειν φασὶν ἡκιστα δὲ ἐπὶ τῶν ἀμπέλων· ἔνιοι δὲ ρόαν δασύνεσθαι καὶ σκιάζειν μᾶλλον τὸν καρπόν· ἔτι δὲ ἡττον ἀποβάλλειν τοὺς κυτίνους. συμβαίνειν δὲ τοῦτο φασι καὶ ἐπὶ τῆς συκῆτος οὐ γάρ ἀποβάλλειν ἀνάπαλιν φυτευθεῖσαν, ἔτι δὲ εὐβατωτέραν γίνεσθαι· οὐκ ἀποβάλλειν δὲ οὐδὲ ἔάν τις ἀποκλάσῃ φυομένης εὐθὺς τὸ ἄκρον.

Αἱ μὲν οὖν φυτεῖαι καὶ γενέσεις δὲν τρόπον ἔχουσι σχεδὸν ὡς τύπῳ περιλαβεῖν εἰρηνται.

VII. Περὶ δὲ τῆς ἐργασίας καὶ τῆς θεραπείας τὰ μέν ἔστι κοινὰ τὰ δὲ ἵδια καθ' ἕκαστον. κοινὰ μὲν ἡ τε σκαπάνη καὶ ἡ ὑδρεία καὶ ἡ κόπρωσις, ἔτι δὲ ἡ διακάθαρσις καὶ ἀφαίρεσις τῶν αὖν. διαφέρουσι δὲ τῷ μᾶλλον καὶ ἡττον. τὰ μὲν φίλυδρα καὶ φιλόκοπρα τὰ δὲ οὐχ ὁμοίως, οἷον ἡ κυπάριττος, ἥπερ οὐ φιλόκοπρον οὐδὲ φίλυδρον, ἀλλὰ καὶ ἀπόλλυσθαι φασιν ἔάν γε νέαν οὖσαν ἐφυδρεύωσι πολλῷ. ρόα δὲ καὶ ἀμπελος φίλυδρα. συκῆ δὲ εὐβλαστοτέρα μὲν ὑδρευομένη τὸν δὲ καρπὸν ἵσχει χείρω πλὴν τῆς Λακωνικῆς· αὕτη δὲ φίλυδρος.

¹ ἀνάπαλιν conj. Sch.; τὰνάπαλιν Ald. cf. C.P. 2. 9. 4; Geop. 10. 45; Plin. 17. 84. ² οὖν ins. H.

³ δασύνεσθαι: see LS. ref. s.v. δασύς.

⁴ cf. C.P. 2. 9. 3.

⁵ εὐβατωτέραν (i.e. 'more manageable'). The reference is to a method of keeping the tree dwarf (Bod.). Plin. l.c. has

ENQUIRY INTO PLANTS, II. VI. 12-VII. 1

Further notes on the propagation of trees.

To return to the other trees :—in propagating them they set the cuttings upside down,¹ as with vine-shoots. Some however² say that that makes no difference, and least of all in propagating the vine ; while others contend that the pomegranate thus propagated has a bushier growth³ and shades the fruit better, and also that it is then⁴ less apt to shed the flower. This also occurs, they say, with the fig ; when it is set upside down, it does not shed its fruit, and it makes a more accessible⁵ tree ; and it does not shed its fruit, even if one breaks off the top⁶ as it begins to grow.

Thus we have given a general sketch of what we find about methods of propagation, and of the ways in which these trees are reproduced.

Of the cultivation of trees.

VII. ⁷ As to cultivation and tendance some requirements apply equally to all trees, some are peculiar to one. Those which apply equally to all are spade-work watering and manuring, and moreover pruning and removal of dead wood. But different trees differ in the degree. Some love moisture and manure, some not so much, as the cypress,⁸ which⁹ is fond neither of manure nor of water, but actually dies, they say, if it is overwatered when young. But the pomegranate and vine are water-loving. The fig grows more vigorously if it is watered, but then its fruit is inferior, except in the case of the Laconian variety, which is water-loving.¹⁰

scansilem (so also G), which seems to be a rendering of *εὐβατ.* *εὐβατοτέραν* U.

⁶ τὸ ἄκρον conj. R. Const. after G ; τὸν καρπὸν UMVP₂ Ald.

⁷ Plin. 17. 246. ⁸ Plin. 17. 247.

⁹ ἥπερ conj. W. from G ; ὥσπερ Ald. ¹⁰ cf. C.P. 3. 6. 6.

THEOPHRASTUS

2 Διακαθαίρεσθαι δὲ πάντα ξητεῖ· βελτίω γὰρ τῶν αὐων ἀφαιρουμένων ὕσπερ ἀλλοτρίων, καὶ τὰς αὐξήσεις καὶ τὰς τροφὰς ἐμποδίζει. δι’ δὲ καὶ . . . ὅταν ἡ γεράνδρυον ὅλως κόπτουσιν· ἡ γὰρ βλάστησις νέα γίνεται τοῦ δένδρου. πλείστης δὲ διακαθάρσεώς φησιν Ἀνδροτίων δεῖσθαι μύρρινον καὶ ἐλάαν· ὅσῳ γὰρ ἀν ἐλάττῳ καταλίπησι, ἀμεινον βλαστήσει καὶ τὸν καρπὸν οἴσει πλειόν. πλὴν ἀμπέλου δῆλον ὅτι· ταύτῃ γὰρ ἀναγκαιότερον καὶ πρὸς βλάστησιν καὶ πρὸς εὔκαρπίαν. ἀπλῶς δὲ καὶ ταύτην καὶ τὴν ἄλλην θεραπείαν πρὸς τὴν ἴδιαν φύσιν ἔκαστῳ ποιητέον.

3 Δεῖσθαι δέ φησιν Ἀνδροτίων καὶ κόπρου δριμυτάτης καὶ πλείστης ὑδρείας, ὕσπερ καὶ τῆς διακαθάρσεως, ἐλάαν καὶ μύρρινον καὶ ρόαν¹ οὐ γὰρ ἔχειν μήτραν οὐδὲ νόσημα κατὰ γῆς οὐδέν· ἀλλ’ ἔπειδαν παλαιὸν ἡ τὸ δένδρον, ἀποτέμνειν δεῖν τοὺς ἀκρεμόνας ἔπειτα τὸ στέλεχος θεραπεύειν ὕσπεράν ἔξ ἀρχῆς φυτευθέν· οὕτω δέ φασι πολυχρονιώτερα καὶ ἴσχυρότατα μύρρινον εἶναι καὶ ἐλάαν. ταῦτα μὲν οὖν ἐπισκέψαντ’ ἄν τις, εἰ καὶ μὴ πάντα ἄλλὰ περί γε τῆς μήτρας.

4 Ἡ δὲ κόπρος οὗτε πᾶσιν ὁμοίως οὕθ’ ἡ αὐτὴ πᾶσιν ἀρμόττει· τὰ μὲν γὰρ δριμείας δεῖται τὰ δὲ ήττον τὰ δὲ παντελῶς κούφης. δριμυτάτη δὲ ἡ τοῦ ἀνθρώπου· καθάπερ καὶ Χαρτόδρας ἀρίστην μὲν ταύτην εἶναι φησι, δευτέραν δὲ τὴν ὑείαν, τρίτην δὲ αἰγός, τετάρτην δὲ προβάτου,

¹ Plin. 17. 248.

³ cf. C.P. 3. 10. 4.

² Name of tree missing. Sch.

⁴ ταύτη conj. W.; ταύτης Ald.

ENQUIRY INTO PLANTS, II. vii. 2-4

¹ All trees require pruning ; for they are improved by removal of the dead wood, which is, as it were, a foreign body, and prevents growth and nourishment. Wherefore when the (tree)² becomes old, they cut off all its boughs : for then the tree breaks afresh. Androtion³ says that the myrtle and olive need more pruning than any other trees ; for the smaller you leave them, the better they will grow, and they will bear better fruit. But the vine of course needs pruning even more ; for it is in the case of this tree⁴ more necessary for promoting both growth and fruitfulness. However, speaking generally, both this and other kinds of tendance must be suited to the particular natural character in each case.

Androtion further says that the olive the myrtle and the pomegranate require the most pungent manure and the heaviest watering, as well as the most thorough pruning, for that then they do not get 'softwood'⁵ nor any disease underground ; but when the tree is old, he adds, one should cut off the boughs, and then attend to the stem as though it were a tree just planted. Thus⁶ treated they say that the myrtle and olive are longer lived and very robust. These statements might be a subject for further enquiry, or, if not all of them, at least what is stated of the 'softwood.'

Manure does not suit all alike, nor is the same manure equally good for all. Some need it pungent, some less so, some need it quite light. The most pungent is human dung : thus Chartodras⁷ says that this is the best, pig-manure being second to it, goat-manure third, fourth that of sheep, fifth that of

⁵ i.e. effete sap-wood. ⁶ οὗτως conj. W. ; οἱ Ald.

⁷ Name perhaps corrupt.

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πέμπτην δὲ βοός, ἕκτην δὲ τὴν λοφούρων. ἡ δὲ συρματῖτις ἄλλη καὶ ἄλλως· ἡ μὲν γὰρ ἀσθενεστέρα ταύτης ἡ δὲ κρείττων.

5 Τὴν δὲ σκαπάνην πᾶσιν οἰονται συμφέρειν, ὥσπερ καὶ τὴν ὄσκαλσιν τοῖς ἐλάττοσιν· εὐτραφέστερα γὰρ γίνεσθαι. τρέφειν δὲ δοκεῖ καὶ ὁ κονιορτὸς ἔνια καὶ θύλλειν ποιεῖν, οἷον τὸν βότρυν, δι’ ὃ καὶ ὑποκονίουσι πολλάκις· οἱ δὲ καὶ τὰς συκᾶς ὑποσκάπτουσιν ἔνθα τούτου δεῖ. Μεγαροὶ δὲ καὶ τοὺς σικύους καὶ τὰς κολοκύντας, ὅταν οἱ ἐτησίαι πιεύσωσι, σκάλλοντες κονιορτοῦσι καὶ οὕτω γλυκυτέρους καὶ ἀπαλωτέρους ποιοῦσιν οὐχ ὑδρεύοντες. τοῦτο μὲν οὖν ὁμολογούμενον. τὴν δὲ ἀμπελον οὕ φασί τινες δεῖν [ἢ] ὑποκονίειν οὐδὲν ὅλως ἀπτεσθαι περκάζοντος τοῦ βότρυος, ἀλλ’ εἰπερ ὅταν ἀπομελανθῆ. οἱ δὲ τὸ ὅλον μηδὲ τότε πλὴν ὅσον ὑποτῆλαι τὴν βοτάνην· ὑπὲρ μὲν οὖν τούτων ἀμφισβητοῦσιν.

6 'Εὰν δέ τι μη φέρῃ καρπὸν ἀλλ’ εἰς βλάστησιν τρέπηται, σχίζουσι τοῦ στελέχους τὸ κατὰ γῆν καὶ λίθον ἐντιθέασιν ὅπως ἀν ῥαγῆ, καί φασι φέρειν. ὁμοίως δὲ καὶ ἔάν τις τῶν ῥιζῶν τινας περιτέμη, δι’ ὃ καὶ τῶν ἀμπέλων ὅταν τραγώσι τοῦτο ποιοῦσι τὰς ἐπιπολῆς. τῶν δὲ συκῶν πρὸς τῷ περιτέμνειν καὶ τέφραν περιπάττουσι καὶ κατασχάζουσι τὰ στελέχη καί φασι φέρειν μᾶλλον. ἀμυγδαλῆ δὲ καὶ πάτταλον ἐγκόψαντες

¹ Lit. 'bushy tails,' i.e. horses asses mules.

² cf. C.P. 3. 16. 3. ³ δεῖ ins. H; so apparently G read.

⁴ δεῖν ὑποκονίειν οὐδὲν ὅλως conj. W. (so Sch., but keeping [ἢ] after δεῖν); δεῖν ἢ ὑποκονίειν οὐδὲν ὅλως UΜV; δεῖν ἢ ὑποκονίειν ἢ ὅλως Ald.

⁵ Plin. 17. 253 and 254.

ENQUIRY INTO PLANTS, II. vii. 4-6

oxen, and sixth that of beasts of burden.¹ Litter manure is of different kinds and is applied in various ways: some kinds are weaker, some stronger.

Spade-work is held to be beneficial to all trees, and also hoeing for the smaller ones, as they then become more vigorous. Even dust² is thought to fertilise some things and make them flourish, for instance the grape; wherefore they often put dust to the roots of the vine. Some also dig in dust about the figs in places where it is deficient.³ In Megara, when the etesian winds are past, they cover the cucumber and gourd plants with dust by raking, and so make the fruits sweeter and tenderer by not watering. On this point there is general agreement. But some say that dust should not be put to the vine,⁴ and that it should not be meddled with at all when the grape is turning, or, if at all, only when it has turned black. Some again say that even then nothing should be done except to pluck up the weeds. So on this point there is a difference of opinion.

⁵ If a tree does not bear fruit but inclines to a leafy growth, they split that part of the stem which is underground and insert a stone corresponding⁶ to the crack thus made, and then, they say, it will bear. The same result follows, if one cuts off some of the roots, and accordingly they thus treat the surface roots of the vine when it runs to leaf. In the case of figs, in addition to root-pruning,⁷ they also sprinkle ashes about the tree, and make gashes in the stems, and then, they say, it bears better.⁸ Into the almond tree they drive an iron peg, and, having thus made

¹ δπως δν βαγῆ Ald.: so G.; ? δπων; δπως δρεάγη conj. W. cf. *Geop.* 5. 35. ⁷ Plin. *l.c.*

⁸ cf. 2. 2. 11; *C.P.* 1. 17. 10; 2. 14. 1; Plin. 7. 253.

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σιδηροῦν ὅταν τετράνωσιν ἄλλον ἀντεμβάλλουσι δρύινον καὶ τῇ γῇ κρύπτουσιν· δὲ καὶ καλοῦσι τινες κολάζειν ὡς ὑβρίζον τὸ δένδρον.

7 Ταῦτὸν δὲ τοῦτο καὶ ἐπὶ τῆς ἀπίου καὶ ἐπ' ἄλλων τινὲς ποιοῦσιν. ἐν Ἀρκαδίᾳ δὲ καὶ εὐθύνειν καλοῦσι τὴν ὄαν· πολὺ γὰρ τὸ δένδρον τοῦτο παρ' αὐτοῖς ἐστι. καὶ φασιν, ὅταν πάθῃ τοῦτο, τὰς μὲν μὴ φερούσας φέρειν τὰς δὲ μὴ πεττούσας ἐκπέττειν καλῶς. ἀμυγδαλῆν δὲ καὶ ἐκ πικρᾶς γίγνεσθαι γλυκεῖαν, ἐάν τις περιορύξας τὸ στέλεχος καὶ τιτράνας ὅσον τε παλαιστιαῖον τὸ πανταχόθεν ἀπορρέον δάκρυνον ἐπὶ ταύτῳ ἐὰς καταρρεῖν. τοῦτο μὲν οὖν ἀν εἴη πρός τε τὸ φέρειν ἄμα καὶ πρὸς τὸ εὐκαρπεῖν.

VIII. Ἀποβάλλει δὲ πρὸ τοῦ πέψαι τὸν καρπὸν ἀμυγδαλῆ μηλέα ρόα ἄπιος καὶ μάλιστα δὴ πάντων συκῆ καὶ φοῖνιξ, πρὸς δὲ καὶ τὰς βοηθείας ζητοῦσι· δθεν καὶ ὁ ἐρινασμός· ἐκ γὰρ τῶν ἐκεῖ κρεμαννυμένων ἐρινῶν ψῆνες ἐκδυόμενοι κατεσθίουσι καὶ πιαίνουσι τὰς κορυφάς. διαφέρουσι δὲ καὶ αἱ χῶραι πρὸς τὰς ἀποβολάς· περὶ γὰρ Ἰταλίαν οὐ φασιν ἀποβάλλειν, δι' δὲ οὐδὲ ἐρι-

¹ The operation being performed at the base of the tree. cf. § 7. ² ἐκπέττειν conj. R. Const.; εἰσπέττειν UMAld.

³ Plin. 17. 252.

⁴ τὸ παντάχοθεν conj. W.; παντάχοθεν τὸ MSS.; so apparently G. cf. C.P. 2. 14. 4.

⁵ πέψαι conj. Sch.; πέμψαι Ald.

⁶ ἐκεῖ κρεμαννυμένων ἐρινῶν I conj.; ἐκεῖ κρεμαννυμένων Ald.; ἐπικρεμαμένων ἐρινῶν conj. W.: but the present partic. is used C.P. 2. 9. 5.

ENQUIRY INTO PLANTS, II. vii. 6-viii. 1

a hole, insert in its place a peg of oak-wood and bury it¹ in the earth, and some call this 'punishing' the tree, since its luxuriance is thus chastened.

Some do the same with the pear and with other trees. In Arcadia they have a similar process which is called 'correcting' the sorb (for that tree is common in that country). And they say that under this treatment those trees that would not bear do so, and those that would not ripen their fruit now ripen² them well.³ It is also said that the almond becomes sweet, instead of bitter, if one digs round the stem and, having bored a hole about a palms-breadth, allows the gum which exudes from all sides⁴ to flow down into it and collect. The object of this would be alike to make the tree bear and to improve the fruit.

Of remedies for the shedding of the fruit: caprification.

VIII. Trees which are apt to shed their fruit before ripening⁵ it are almond apple pomegranate pear and, above all, fig and date-palm; and men try to find the suitable remedies for this. This is the reason for the process called 'caprification'; gall-insects come out of the wild figs which are hanging there,⁶ eat the tops of the cultivated figs and so make them swell.⁷ The shedding of the fruit differs according to the soil: in Italy⁸ they say that it does not occur, and so they do not use caprification,⁹

⁷ παίλνουσι: MVAld.; διείρουσι conj. W. ? πεναίλνουσι, 'ripen,' which is the word used in the parallel pass. C.P. 2. 9. 6, the object of the process being to cause the figs to dry.

⁸ Plin. 15. 81. 'Italy' means South Italy. cf. 4. 5. 5 and 6; 5. 8. 1.

⁹ ἐπινάζουσιν conj. Bod.; ἐπινοῦσιν Ald. H.

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νάζουσιν· οὐδέ ἐν τοῖς καταβορείοις καὶ λεπτογείοις, οἷον ἐπὶ Φαλύκῳ τῆς Μεγαρίδος· οὐδὲ τῆς Κορινθίας ἐν τισι τόποις. ὡσαύτως δὲ καὶ ἡ τῶν πνευμάτων κατάστασις· βορείοις γὰρ μᾶλλον ἡ νοτίοις ἀποβάλλουσι, καν ψυχρότερα καὶ πλείω γένηται μᾶλλον· ἔτι δ' αὐτῶν τῶν δένδρων ἡ φύσις· τὰ πρώτα γὰρ ἀποβάλλει, τὰ δ' ὄψια οὐκ ἐκβάλλει, καθάπερ ἡ Λακωνικὴ καὶ αἱ ἄλλαι. δι' ὃ καὶ οὐκ ἐρινάζουσι ταύτας. ταῦτα μὲν οὖν ἔν τε τοῖς τόποις καὶ τοῖς γένεσι καὶ τῇ καταστάσει τοῦ ἀέρος ἔχει τὰς διαφοράς.

2 Οἱ δὲ ψῆνες ἐκδύονται μὲν ἐκ τοῦ ἐρινεοῦ, καθάπερ εἴρηται· γίνονται δ' ἐκ τῶν κεγχραμίδων. σημεῖον δὲ λέγουσιν, ὅτι ἐπειδὰν ἐκδύωσιν οὐκ ἔνεισι κεγχραμίδες. ἐκδύονται δὲ οἱ πολλοὶ ἐγκαταλιπόντες ἡ πόδα ἡ πτερόν. γένος δέ τι καὶ ἔτερόν ἐστι τῶν ψηνῶν, ὃ καλοῦσι κεντρίνας· οὗτοι δ' ἀργοὶ καθάπερ κηφῆνες· καὶ τοὺς εἰσδυομένους τῶν ἔτέρων κτείνουσιν αὐτοὶ δὲ ἐναποθνήσκουσιν. ἐπαινοῦσι δὲ μάλιστα τῶν ἐρινῶν τὰ μέλανα τὰ ἐκ τῶν πετρωδῶν χωρίων· πολλὰς

3 γὰρ ἔχει ταῦτα κεγχραμίδας. γιγνώσκεται δὲ τὸ ἐρινασμένον τῷ ἐρυθρὸν εἶναι καὶ ποικίλον καὶ ἴσχυρόν· τὸ δ' ἀνερίναστον λευκὸν καὶ ἀσθενές· προστιθέασι δὲ τοῖς δεομένοις ὅταν ὕση. ὅπου δὲ πλεῖστος κονιορτός, ἐνταῦθα πλεῖστα καὶ

¹ cf. 8. 2. 11.

² ψυχρότερα καὶ πλείω conj. Sch.; τεχνοτέρα καὶ πλείων MV Ald.; τεχρότερα καὶ πλείω U.

³ πρώτα conj. Sch. from G; πρώτα Ald. H.

⁴ Plin. 17. 255 and 256.

ENQUIRY INTO PLANTS, II. viii. 1-3

nor is it practised in places which face north nor in those with light soils, as at Phalykos¹ in the Megarid, nor in certain parts of the district of Corinth. Also conditions as to wind make a difference; the fruit is shed more with northerly than with southerly winds, and this also happens more if the winds are cold and frequent.² Moreover the character of the tree itself makes a difference; for some kinds, such as the Laconian and other such kinds, shed their early³ figs but not the later ones. Wherefore caprification is not practised with these. Such are the changes to which the fig is subject in respect of locality kind and climatic conditions.

⁴ Now the gall-insects come, as has been said, out of the wild fig, and they are engendered from the seeds. The proof given of this is that, when they come out, there are no seeds left in the fruit; and most of them in coming out leave a leg or a wing behind. There is another kind of gall-insect which is called *kentrines*; these insects are sluggish, like drones, they kill those of the other kind who are entering the figs, and they themselves die in the fruit. The black kind of wild fig which grows in rocky places is most commended for caprification, as these figs contain numerous seeds.⁵ A fig which has been subject to caprification is known by being red and parti-coloured and stout, while one which has not been so treated is pale and sickly. The treatment is applied to the trees which need it, after rain. The wild figs are most plentiful and most potent

⁵ i.e. and so should produce more gall-insects: in C.P. 2. 9. 6 it is implied that the insect is produced by putrefaction of the seeds of the wild fig.

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ἰσχυρότατα τὰ ἔρινὰ γίνεται. φασὶ δὲ ἔρινάζειν καὶ τὸ πόλιον, ὅπόταν αὐτῷ καρπὸς ἢ πολύς, καὶ τὸν τῆς πτελέας κωρύκους¹ ἐγγίνεται γὰρ καὶ ἐν τούτοις θηρίδι² ἄπτα. κυνῆπες ὅταν ἐν ταῖς συκαῖς γίνωνται κατεσθίουσι τὸν ψῆνας. ἄκος δὲ τούτου φασὶν εἶναι τὸν καρκίνους προσπερονᾶν· πρὸς γὰρ τούτους τρέπεσθαι τὸν κυνῆπας. ἀλλὰ γὰρ δὴ ταῖς μὲν συκαῖς αὐταὶ βοήθεια.

4 Τοῖς δὲ φοίνιξιν αἱ ἀπὸ τῶν ἀρρένων πρὸς τὸν θήλεις· οὗτοι γάρ εἰσιν οἱ ἐπιμένειν ποιοῦντες καὶ ἐκπέττειν, δὲ καλοῦσί τινες ἐκ τῆς ὁμοιότητος ὀλυνθάζειν. γίνεται δὲ τόνδε τὸν τρόπον. ὅταν ἀνθῆ τὸ ἄρρεν, ἀποτέμνουσι τὴν σπάθην ἐφ' ἡς τὸ ἄνθος εὐθὺς ὥσπερ ἔχει, τὸν τε χυοῦν καὶ τὸ ἄνθος καὶ τὸν κονιορτὸν κατασείουσι κατὰ τοῦ καρποῦ τῆς θηλείας· κὰν τοῦτο πάθη, διατηρεῖ καὶ οὐκ ἀποβάλλει. φαίνεται δὲ ἀμφοῖν ἀπὸ τοῦ ἄρρενος τοῖς θήλεσι βοήθεια γίνεσθαι· θῆλυ γὰρ καλοῦσι τὸ καρποφόρον· ἀλλ' ἡ μὲν οἰον μᾶξις· ἡ δὲ κατ' ἄλλον τρόπον.

¹ δπότ' ἀν . . . πολύς conj. W. from G, *cum copiose fructificat*; δπόταν αἰγίπυρος ἢ πολύς MSS. U adds καὶ before δπόταν.

² κωρύκους I conj. In 3. 14. 1. the elm is said to bear κωρυκίδες which contain gnat-like creatures; these growths are called κωρυκάδη τινα κοῖλα 3. 15. 4; and in 3. 7. 3. the

where there is most dust. And they say that hulwort also, when it fruits freely,¹ and the 'gall-bags'² of the elm are used for caprification. For certain little creatures are engendered in these also. When the *knips* is found in figs, it eats the gall-insects. It is to prevent this, it is said, that they nail up the crabs; for the *knips* then turns its attention to these. Such are the ways of assisting the fig-trees.

With dates it is helpful to bring the male to the female; for it is the male which causes the fruit to persist and ripen, and this process some call, by analogy, 'the use of the wild fruit.'³ The process is thus performed: when the male palm is in flower, they at once cut off the spathe on which the flower is, just as it is, and shake the bloom with the flower and the dust over the fruit of the female, and, if this is done to it, it retains the fruit and does not shed it. In the case both of the fig and of the date it appears that the 'male' renders aid to the 'female,' —for the fruit-bearing tree is called 'female'— but while in the latter case there is a union of the two sexes, in the former the result is brought about somewhat differently.

same thing is referred to as *τὸ θυλακῶδες τοῦτο*, where *τοῦτο* = 'the well-known'; cf. also 9. 1. 2, where Sch. restores *κωρύκους*; cf. Pall. 4. 10. 28. *κυπαῖρους* (?) U; *κυπέρους* MV; *κύκεριν* Ald.; *κυπτάρους* conj. W.

³ *δλυνθάζειν*, from *δλυνθός*, a kind of wild fig, as *ἐρινδζειν*, from *ἐρινδός*, the wild fig used for caprification. cf. C.P. 3. 18. 1.

BOOK III

Γ

I. Ἐπεὶ δὲ περὶ τῶν ἡμέρων δένδρων εἴρηται, λεκτέον ὁμοίως καὶ περὶ τῶν ἀγρίων, εἴ τέ τι ταῦτὸν καὶ ἔτερον ἔχουσι τοῖς ἡμέροις εἴθ' ὅλως ἴδιον τῆς φύσεως.

Αἱ μὲν οὖν γενέσεις ἀπλαῖ τινες αὐτῶν εἰσι· πάντα γὰρ ή ἀπὸ σπέρματος ή ἀπὸ ρίζης φύεται.¹ τοῦτο δ' οὐχ ὡς οὐκ ἐνδεχόμενον καὶ ἄλλως, ἀλλ' ἵσως διὰ τὸ μὴ πειρᾶσθαι μηδένα μηδὲ φυτεύειν ἐκφύοιτο δ' ἀν εἰ λαμβάνοιεν τόπους ἐπιτηδείους καὶ θεραπείαν τὴν ἀρμόττουσαν· ὥσπερ καὶ νῦν τὰ ἀλσώδη καὶ φίλυδρα, λέγω δ' οἷον πλάτανον ἵτεαν λεύκην αἴγειρον πτελέαν· ἅπαντα γὰρ ταῦτα καὶ τὰ τοιαῦτα φυτευόμενα βλαστάνει καὶ τάχιστα καὶ κάλλιστα ἀπὸ τῶν παρασπάδων, ὥστε καὶ μεγάλας οὖσας ἥδη καὶ ἰσοδένδρους ἄν τις μεταθῆ διαμένειν φυτεύεται δὲ τὰ πολλὰ αὐτῶν καὶ καταπηγνύμενα, καθάπερ ή λεύκη καὶ ή αἴγειρος.

2 Τούτων μὲν οὖν πρὸς τὴν σπερματικὴν καὶ τὴν ἀπὸ τῶν ρίζῶν καὶ αὗτη γένεσίς ἔστι· τῶν δὲ

¹ ἐκφύοιτο conj. W.; ἐπιφύοιτο UΜVAlD.

BOOK III

OF WILD TREES.

Of the ways in which wild trees originate.

I. Now that we have spoken of cultivated trees, we must in like manner speak of wild ones, noting in what respects they agree with or differ from cultivated trees, and whether in any respects their character is altogether peculiar to themselves.

Now the ways in which they come into being are fairly simple; they all grow either from seed or from a root. But the reason of this is not that they could not possibly grow in any other way, but merely perhaps that no one even tries to plant them otherwise; whereas they might grow¹ from slips, if they were provided with a suitable position and received the fitting kind of tendance, as may be said even now of the trees of woodland and marsh, such as plane willow abele black poplar and elm; all these and other similar trees grow very quickly and well when they are planted from pieces torn off, so that² they survive, even if at the time of shifting they are already tall and as big as trees. Most of these are simply planted by being set firmly, for instance, the abele and the black poplar.

Such is the way in which these originate as well as from seed or from roots; the others grow only

² ὅστε καὶ μεγ. conj. Sch.; καὶ ὅστε καὶ μεγ. UM; καὶ ὅστε μεγ. PAlD.

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ἄλλων ἐκεῖναι· πλὴν ὅσα μόνον ἀπὸ σπέρματος φύεται, καθάπερ ἐλάτη πεύκη πίτυς. ὅσα δὲ ἔχει σπέρμα καὶ καρπόν, κανὸν ἀπὸ ρίζης γίνηται, καὶ ἀπὸ τούτων ἐπεὶ καὶ τὰ δοκοῦντα ἄκαρπα εἶναι γεννᾶν φασιν, οἷον πτελέαν ἵτεαν. σημεῖον δὲ λέγουσιν οὐ μόνον ὅτι φύεται πολλὰ τῶν ρίζῶν ἀπηρτημένα καθ' οὓς ἀνὴρ τόπους, ἀλλὰ καὶ τὰ συμβαίνοντα θεωροῦντες, οἷον ἐν Φενεῷ τῆς Ἀρκαδίας, ὡς ἔξερράγη τὸ συναθροισθὲν ὅνδωρ ἐν τῷ πεδίῳ φραχθέντων τῶν βερέθρων· ὅπου μὲν ἐγγὺς ἦσαν ἵτεαι πεφυκυῖαι τοῦ καταποθέντος τόπου, τῷ ὑστέρῳ ἔτει μετὰ τὴν ἀναξήρανσιν ἐνταῦθα αὐθις ἀναφῦναι φασιν ἵτεαν· ὅπου δὲ πτελέαι αὐθις πτελέας, καθάπερ καὶ ὅπου πεύκαι καὶ ἔλαται πεύκας καὶ ἐλάτας, ὥσπερ μιμουμένων κάκείνων.

3 Ἀλλὰ τὴν ἵτεαν ταχὺ προκαταβάλλειν πρὸ τοῦ τελείως ἀδρῦναι καὶ πέψαι τὸν καρπὸν· δι' ὃ καὶ τὸν ποιητὴν οὐ κακῶς προσαγορεύειν αὐτὴν ὡλεσίκαρπον.

Τῆς δὲ πτελέας κάκεῖνο σημεῖον ὑπολαμβάνουσιν· ὅταν γὰρ ἀπὸ τῶν πνευμάτων εἰς τοὺς ἔχομένους τόπους ὁ καρπὸς ἀπενεχθῇ, φύεσθαι φασι. παραπλήσιον δὲ ἔοικεν εἶναι τὸ συμβαίνον ὃ καὶ ἐπὶ τῶν φρυγανικῶν καὶ ποιωδῶν τινῶν ἔστιν· οὐκ ἔχόντων γὰρ σπέρμα φανερόν, ἀλλὰ

¹ cf. 5. 4. 6.

² 'Katavothra' (now called 'the devil's holes,' see Lawson, cited below); cf. Paus. 8. 14; Catull. 68. 109; Plut. *de sera numinis viudicta*, 557 c; Plin. 31. 36; Frazer, *Pausanias and other Greek Sketches*, pp. 315 foll.; Lawson, *Modern Greek Folklore and Ancient Greek Religion*, p. 85.

in these two ways—while some of them, such as silver-fir fir and Aleppo pine grow *only* from seed. All those that have seed and fruit, even if they grow from a root, will grow from seed too; for they say that even those which, like elm and willow, appear to have no fruit reproduce themselves. For proof they give the fact that many such trees come up at a distance from the roots of the original tree, whatever the position may be; and further, they have observed a thing which occasionally happens; for instance, when at Pheneos¹ in Arcadia the water which had collected in the plain since the underground channels² were blocked burst forth, where there were willows growing near the inundated region, the next year after it had dried up they say that willows grew again; and where there had been elms, elms³ grew, even as, where there had been firs and silver-firs, these trees reappeared—as if the former trees followed the example⁴ of the latter.

But the willow is said to shed its fruit early, before it is completely matured and ripened; and so the poet⁵ not unfittingly calls it “the willow which loses its fruit.”

That the elm also reproduces itself the following is taken to be a proof: when the fruit is carried by the winds to neighbouring spots, they say that young trees grow from it. Something similar to this appears to be what happens in the case of certain under-shrubs and herbaceous plants; though they have no visible seed, but some of them only a sort of

³ πτελέας αὐθις πτελέας conj. St.; πτελέας ἀντὶ πελέας U; πτελέας ἀντὶ πτελέας MV; πτελέας αὐθις πτελέας P; πτελέα αὐθις πτελέας Ald.

⁴ i.e. by growing from seed, as conifers normally do.

⁵ Homer, *Od.* 10. 510; *cf.* Plin. 16. 110.

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τῶν μὲν οἰον χνοῦν τῶν δ' ἄνθος, ὥσπερ τὸ θύμον, ὅμως ἀπὸ τούτων βλαστάνουσιν. ἐπεὶ ἡ γε πλάτανος ἔχει φανερῶς καὶ ἀπὸ τούτων φύεται. τοῦτο δ' ἔξ ἄλλων τε δῆλον κάκενο μέγιστον σημεῖον· ὥφθη γὰρ ἡδη ποτὲ πεφυκυῖα πλάτανος ἐν τρίποδι χαλκῷ.

4 Ταύτας τε δὴ τὰς γενέσεις ὑποληπτέον εἶναι τῶν ἀγρίων καὶ ἔτι τὰς αὐτομάτους, ἂς καὶ οἱ φυσιολόγοι λέγουσιν. Ἀναξαγόρας μὲν τὸν ἀέρα πάντων φάσκων ἔχειν σπέρματα καὶ ταῦτα συγκαταφερόμενα τῷ ὕδατι γεννᾶν τὰ φυτά. Διογένης δὲ σηπομένου τοῦ ὕδατος καὶ μίξιν τινὰ λαμβάνοντος πρὸς τὴν γῆν. Κλείδημος δὲ συνεστάναι μὲν ἐκ τῶν αὐτῶν τοῖς ζώοις, δσῳ δὲ θολερωτέρων καὶ ψυχροτέρων τοσοῦτον ἀπέχειν τοῦ ζῶα εἶναι. [λέγουσι δέ τινες καὶ ἄλλοι περὶ τῆς γενέσεως.]

5 Ἀλλ' αὕτη μὲν ἀπηρτημένη πώς ἔστι τῆς αἰσθήσεως. ἄλλαι δὲ ὁμολογούμεναι καὶ ἐμφανεῖς, οἰον ὅταν ἔφοδος γένηται ποταμοῦ παρεκβάντος τὸ ρέθιρον ἡ καὶ ὅλως ἐτέρωθι ποιησαμένου, καθάπερ ὁ Νέσος ἐν τῇ Ἀβδηρίτιδι πολλάκις μεταβαίνει, καὶ ἅμα τῇ μεταβάσει τοσαύτην ὑλην συγγεννᾶ τοῖς τόποις, ὥστε τῷ τρίτῳ ἔτει συνηρεφεῖν. καὶ πάλιν ὅταν ἐπομβρίαι κατάσχωσι πλείω χρόνον· καὶ γὰρ ἐν ταύταις βλαστήσεις γίνονται φυτῶν. ἔοικε δὲ ἡ μὲν τῶν ποταμῶν ἔφοδος ἐπάγειν σπέρματα καὶ καρπούς, καὶ τοὺς ὄχετούς φασι τὰ τῶν ποιωδῶν· ἡ δ' ἐπομβρία

¹ cf. C.P. 1. 5. 2.

² Sc. of Apollonia, the 'Ionian' philosopher.

³ cf. C.P. 1. 10. 3; 3. 23. 1; Arist. Meteor. 2. 9.

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down, and others only a flower, such as thyme, young plants nevertheless grow from these. As for the plane, it obviously has seeds, and seedlings grow from them. This is evident in various ways, and here is a very strong proof—a plane-tree has before now been seen which came up in a brass pot.

Such we must suppose are the ways in which wild trees originate, apart from the spontaneous ways of which natural philosophers tell. ¹ Anaxagoras says that the air contains the seeds of all things, and that these, carried down by the rain, produce the plants; while Diogenes ² says that this happens when water decomposes and mixes in some sort with earth. ³ Kleidemos maintains that plants are made of the same elements as animals, but that they fall short of being animals in proportion as their composition is less pure and as they are colder. ⁴ And there are other philosophers also who speak of spontaneous generation.

But this kind of generation is somehow beyond the ken of our senses. There are other admitted and observable kinds, as when a river in flood gets over its banks or has altogether changed its course, even as the Nesos in the district of Abdera often alters its course, and in so doing causes such a growth of forest in that region that by the third year it casts a thick shade. The same result ensues when heavy rains prevail for a long time; during these too many plants shoot up. Now, as the flooding of a river, it would appear, conveys seeds of fruits of trees, and, as they say, irrigation channels convey the ⁵ seeds of herbaceous plants, so heavy

¹ λέγουσι . . . γενεσέως apparently a gloss (W.).

² τὰ conj. W.; τὴν MAld.

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τοῦτο ποιεῖ ταῦτό· συγκαταφέρει γὰρ πολλὰ τῶν σπερμάτων, καὶ ἄμα σῆψιν τινα τῆς γῆς καὶ τοῦ ὕδατος· ἐπεὶ καὶ ἡ μίξις αὐτὴ τῆς Αἰγυπτίας 6 γῆς δοκεῖ τινα γεννᾶν ὕλην. ἐνιαχοῦ δέ, ἀν μόνον ὑπεργάσωνται καὶ κινήσωσιν, εὐθὺς ἀναβλαστάνει τὰ οἰκεῖα τῆς χώρας, ὡσπερ ἐν Κρήτῃ κυπάριττοι. γίνεται δὲ παραπλήσιόν τι τούτῳ καὶ ἐν τοῖς ἐλάττοσιν· ἄμα γὰρ κινουμένης ἀναβλαστάνει πόα τις ἐν ἐκάστοις. ἐν δὲ τοῖς ἡμιβρόχοις ἐὰν ὑπονεάσης φαίνεσθαι φασι τρίβολον. αὐται μὲν οὖν ἐν τῇ μεταβολῇ τῆς χώρας εἰσίν, εἴτε καὶ ἐνυπαρχόντων σπερμάτων εἴτε καὶ αὐτῆς πως διατιθεμένης· ὅπερ ἵσως οὐκ ἄτοπον ἐγκατακλειομένων ἄμα τῶν ὑγρῶν· ἐνιαχοῦ δὲ καὶ ὑδάτων ἐπιγινομένων ἴδιώτερον ἀνατεῖλαι ὕλης πλῆθος, ὡσπερ ἐν Κυρήνῃ πιττώδους τινὸς γενομένου καὶ παχέος· οὕτως γὰρ ἀνεβλάστησεν ἡ πλησίον ὕλη πρότερον οὐκ οὖσα. φασὶ δὲ καὶ τό γε σίλφιον οὐκ ὁν πρότερον ἐκ τοιαύτης τινὸς αἰτίας φανῆναι. τρόποι μὲν οὖν τοιούτοι τῶν τοιούτων γενέσεων.

II. Πάντα δὲ κάρπιμα ἡ ἄκαρπα, καὶ ἀείφυλλα ἡ φυλλοβόλα, καὶ ἀνθοῦντα ἡ ἀνανθῆ· κοιναὶ

¹ ἡ δ' . . . ταῦτα conj. W.; ἡ δ' ἐπ. τοῦτ' αὐτὸν ἐποίει ταῦτό UΜV (δ' αὐτὸν marked doubtful in U); ἡ δ' ἐπ. τοῦτ' αὐτὸν ἐποίει Ald. ² Plin. 16. 142.

³ i.e. and is released by working the ground.

⁴ cf. C.P. 1. 5. 1; Plin. 16. 143, who gives the date A.U.C. 130; cf. 19. 41.

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rain acts in the same way¹; for it brings down many of the seeds with it, and at the same time causes a sort of decomposition of the earth and of the water. In fact, the mere mixture of earth with water in Egypt seems to produce a kind of vegetation. And in some places, if the ground is merely lightly worked and stirred, the plants native to the district immediately spring up;² for instance, the cypress in Crete. And something similar to this occurs even in smaller plants; as soon as the earth is stirred, wherever it may be, a sort of vegetation comes up. And in partly saturated soil, if you break up the ground, they say that caltrop appears. Now these ways of origination are due to the change which takes place in the soil, whether there were seeds in it already, or whether the soil itself somehow produces the result. And the latter explanation is perhaps not strange, seeing that the moist element is also locked up in the soil.³ Again, in some places they say that after rain a more singular abundance of vegetation has been known to spring up; for instance, at Cyrene, after a heavy pitchy shower had fallen: for it was under these circumstances that there sprang up the wood⁴ which is near the town, though till then it did not exist. They say also that silphium⁵ has been known to appear from some such cause, where there was none before.⁶ Such are the ways in which these kinds of generation come about.

Of the differences between wild and cultivated trees.

II. All trees are either fruit-bearing or without fruit, either evergreen or deciduous, either flowering

⁵ cf. 6. 3.

⁶ τοιοῦτοι MSS.; τοσοῦτοι conj. W.

γάρ τινες διαιρέσεις ἐπὶ πάντων εἰσὶν ὁμοίως
 ἡμέρων τε καὶ ἀγρίων. ἵδια δὲ πρὸς τὰ ἡμέρα
 τῶν ἀγρίων ὀψικαρπία τε καὶ ἴσχὺς καὶ πολυ-
 καρπία τῷ προφαίνειν πεπαίνει τε γὰρ ὀψιαί-
 τερον καὶ τὸ ὅλον ἀνθεῖ καὶ βλαστάνει ὡς ἐπὶ τὸ
 πᾶν· καὶ ἴσχυρότερα τῇ φύσει· καὶ προφαίνει
 μὲν πλείω καρπὸν ἐκπέττει δ' ἡττον, εἰ μὴ καὶ
 πάντα ἄλλά γε τὰ ὁμογενῆ, οἷον ἐλάς καὶ ἀπίου
 κότινος καὶ ἀχράς. ἅπαντα γὰρ οὕτως, πλὴν
 εἴ τι σπάνιον, ὥσπερ ἐπὶ τῶν κρανείων καὶ τῶν
 οὖων· ταῦτα γὰρ δή φασι πεπαίτερα καὶ ἡδύτερα
 τὰ ἄγρια τῶν ἡμέρων εἶναι· καὶ εἰ δή τι ἄλλο μὴ
 προσδέχεται γεωργίαν ἢ δένδρον ἢ καὶ τι τῶν
 ἐλαττόνων, οἷον τὸ σίλφιον καὶ ἡ κάππαρις καὶ
 τῶν χεδροπῶν ὁ θέρμος, ἢ καὶ μάλιστ' ἄν τις
² ἄγρια τὴν φύσιν εἴποι. τὸ γὰρ μὴ προσδεχόμενον
 ἡμέρωσιν, ὥσπερ ἐν τοῖς ζώοις, τοῦτο ἄγριον τῇ
 φύσει. καίτοι φησὶν "Ιππων ἅπαν καὶ ἡμερον
 καὶ ἄγριον εἶναι, καὶ θεραπευόμενον μὲν ἡμερον
 μὴ θεραπευόμενον δὲ ἄγριον, τῇ μὲν ὄρθως λέγων
 τῇ δὲ οὐκ ὄρθως. ἔξαμελούμενον γὰρ ἅπαν
 χεῖρον γίνεται καὶ ἀπαγριοῦται, θεραπευόμενον
 δὲ οὐχ ἅπαν βέλτιον, ὥσπερ εἴρηται. ὁ δὲ
 χωριστέον καὶ τὰ μὲν ἄγρια τὰ δ' ἡμερα λεκτέον,

¹ εἰ μὴ . . . δμογενῆ conj. W.; εἰ μὴ καὶ πάντα τὰ ἄλλα καὶ
 τὰ δμοιογενῆ UΜV Ald. H.

² cf. C.P. 3. 1. 4. ³ cf. 1. 3. 5 n.

⁴ i.e. the terms 'cultivated' and 'wild' do not denote
 distinct 'kinds.'

or flowerless ; for certain distinctions apply to all trees alike, whether cultivated or wild. To wild trees, as compared with cultivated ones, belong the special properties of fruiting late, of greater vigour, of abundance of fruit, produced if not matured ; for they ripen their fruit later, and in general their time of flowering and making growth is later ; also they are more vigorous in growth, and so, though they produce more fruit, they ripen it less ; if¹ this is not universally true, at least it holds good of the wild olive and pear as compared with the cultivated forms of these trees. This is generally true with few exceptions, as in the cornelian cherry and sorb ; for the wild forms of these, they say, ripen their fruit better, and it is sweeter than in the cultivated forms. ² And the rule also does not hold good of anything which does not admit of cultivation, whether it be a tree or one of the smaller plants, as silphium caper and, among leguminous plants, the lupin ; these one might say are specially wild in their character. For, as with animals which do not submit to domestication, so a plant which does not submit to cultivation may be called wild in its essential character. However Hippo³ declares that of every plant there exists both a cultivated and a wild form, and that 'cultivated' simply means⁴ that the plant has received attention, while 'wild' means that it has not ; but though he is partly right, he is partly wrong. It is true that any plant deteriorates by neglect and so becomes wild ; but it is not true that every plant may be improved by attention,⁵ as has been said. Wherefore⁶ we must make our distinction and call some things wild, others culti-

⁵ i.e. and so become 'cultivated.'

⁶ δ δη MSS. ; διδ conj. Sch. from G.

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ῶσπερ τῶν ξώων τὰ συνανθρωπευόμενα καὶ τὰ δεχόμενα τιθασείαν.

3 Ἀλλὰ τοῦτο μὲν οὐδὲν ἵσως διαφέρει ποτέρως ῥητέον. ἅπαν δὲ τὸ ἔξαγριούμενον τοῖς τε καρποῖς χείρον γίνεται καὶ αὐτὸς βραχύτερον καὶ φύλλοις καὶ κλωσὶ καὶ φλοιῷ καὶ τῇ ὅλῃ μορφῇ· καὶ γὰρ πυκνότερα καὶ οὐλότερα καὶ σκληρότερα καὶ ταῦτα καὶ ὅλη ἡ φύσις γίνεται, ὡς ἐν τούτοις μάλιστα τῆς διαφορᾶς τῶν ἡμέρων καὶ τῶν ἀγρίων γινομένης. δι’ ὃ καὶ ὅσα τῶν ἡμερουμένων τοιαῦτα τυγχάνει, ταῦτα ἄγριά φασιν εἶναι, καθάπερ τὴν πεύκην καὶ τὴν κυπάριττον, ἡ ὅλως ἡ τὴν ἄρρενα, καὶ τὴν καρύαν δὲ καὶ τὴν διοσβάλανον.

4 Ἐπι τε τῷ φιλόψυχρα καὶ ὄρεινὰ μᾶλλον εἶναι· καὶ γὰρ τοῦτο λαμβάνεται πρὸς τὴν ἀγριότητα τῶν δένδρων καὶ ὅλως τῶν φυτῶν, εἴτ’ οὖν καθ’ αὐτὸς λαμβανόμενον εἴτε κατὰ συμβεβηκός.

5 ‘Ο μὲν οὖν τῶν ἀγρίων ἀφορισμὸς εἴθ’ οὗτως ἡ καὶ ἄλλως ληπτέος, οὐδὲν ἀν ἵσως διενέγκοι πρὸς τὰ νῦν ἐκεῖνο δὲ ἀληθές, ὡς γε τῷ τύπῳ καὶ ἀπλῶς εἰπεῖν, ὅτι μᾶλλον ὄρεινὰ τὰ ἄγρια καὶ εὐθενεῖ τὰ πλείω καὶ μᾶλλον ἐν τούτοις τοῖς τόποις, ἐὰν μή τις λαμβάνῃ τὰ φίλυδρα καὶ παραποτάμια καὶ ἀλσώδη. ταῦτα γὰρ καὶ τὰ τοιαῦτα τυγχάνει πεδεινὰ μᾶλλον. οὐ μὴν ἀλλ’ ἐν γε τοῖς μεγάλοις ὄρεσιν, οἷον Παρνησῷ τε καὶ Κυλλήνῃ καὶ Ὀλύμπῳ τῷ Πιερικῷ τε καὶ τῷ Μυσίῳ καὶ εἴ που τοιοῦτον ἔτερον, ἅπαντα

¹ τιθασείαν conj. W., cf. Plat. Pol. 264c; τιθάσιον UMAld.

vated—the latter class corresponding to those animals which live with man and can be tamed.¹

But perhaps it does not matter which way this should be put. Any tree which runs wild deteriorates in its fruits, and itself becomes dwarfed in leaves branches bark and appearance generally; for under cultivation these parts, as well as the whole growth of the tree, become closer, more compact² and harder; which indicates that the difference between cultivated and wild is chiefly shown in these respects. And so those trees which show these characteristics under cultivation they say are really wild, for instance fir cypress, or at least the 'male' kind, hazel and chestnut.

Moreover these wild forms are distinguished by having greater liking for cold and for hilly country: for that too is regarded as a means of recognising wild trees and wild plants generally, whether it is so regarded in itself or as being only incidentally a distinguishing mark.

So the definition of wild kinds, whether it should be thus made or otherwise, perhaps makes no difference for our present purpose. But it is certainly true, speaking³ broadly and generally, that the wild trees are more to be found in hilly country, and that the greater part of them flourish more in such regions, with the exception of those which love water or grow by river sides or in woods; these and such-like trees are rather trees of the plain. However on great mountains, such as Parnassus Cyllene the Pierian and the Mysian Olympus, and such regions anywhere

² οὐλότερα conj. W. from G, *spissiora*; ὀρθότερα MSS. cf. C.P. 6. 11. 8.

³ ὡς γε conj. Sch.; ὡστε UM; ὡς ἐν Ald.H.

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φύεται διὰ τὴν πολυειδίαν τῶν τόπων· ἔχουσι γὰρ καὶ λιμνώδεις καὶ ἐνύγρους καὶ ἔνδροις καὶ γεώδεις καὶ πετρώδεις καὶ τοὺς ἀνὰ μέσον λειμῶνας καὶ σχεδὸν ὅσαι διαφορὰ τῆς γῆς· ἔτι δὲ τοὺς μὲν κοίλους καὶ εὐδιεινοὺς τοὺς δὲ μετεώρους καὶ προσηνέμους· ὥστε δύνασθαι παντοῦνα καὶ τὰ ἐν τοῖς πεδίοις φέρειν.

6 Οὐδὲν δ' ἄτοπον οὐδέν εἰ ἔνια μὴ οὕτω πάμφορα τῶν ὄρων, ἀλλ' ἴδιωτέρας τινὸς ὥλης ἢ πάσης ἢ τῆς πλείστης, οἷον ἐν τῇ Κρήτῃ τὰ Ἰδαῖα· κυπάριττος γὰρ ἔκει· καὶ τὰ περὶ Κιλικίαν καὶ Συρίαν, ἐν οἷς κέδρος· ἔνιαχοῦ δὲ τῆς Συρίας τέρμινθος. αἱ γὰρ διαφορὰ τῆς χώρας τὴν ἴδιότητα ποιοῦσιν. ἀλλ' εἴρηται τὸ ἴδιον ὡς ἐπὶ πᾶν.

III. Ἰδια δὲ τὰ τοιάδε τῶν ὄρεινῶν, ἀ ἐν τοῖς πεδίοις οὐ φύεται, [περὶ τὴν Μακεδονίαν] ἐλάτη πεύκη πίτυς ἀγρία φίλυρα ζυγία φηγὸς πύξις ἀνδράχλη μίλος ἄρκευθος τέρμινθος ἐρινεὸς φιλύκη ἀφάρκη καρύα διοσβάλανος πρῖνος. τὰ δὲ καὶ ἐν τοῖς πεδίοις μυρίκη πτελέα λεύκη ἵτεα αἴγειρος κρανεία θηλυκρανεία κλήθρα δρῦς λακάρη ἀχρὰς μηλέα δστρύα κήλαστρον μελία παλίουρος ὁξυάκανθος <σφένδαμνος,> ἦν ἐν μὲν τῷ

¹ ἐν . . . Ἰδαῖα conj. W. (after Sch., who conj. τὰ ἐν); τὰ ἐν κρήτῃ τῇ Ἰδαῖᾳ U Ald.

² i.e. it is not meant that a tree which is 'special' to Mount Ida (e.g.) occurs *only* there.

³ περὶ τὴν Μακ. ? a gloss; περὶ τε τὴν Μακ. MP₂Ald.; τε om. P.

ENQUIRY INTO PLANTS, III. II. 5-III. I

else, all kinds grow, because of the diversity of positions afforded them. For such mountains offer positions which are marshy, wet, dry, deep-soiled or rocky ; they have also their meadow land here and there, and in fact almost every variety of soil ; again they present positions which lie low and are sheltered, as well as others which are lofty and exposed to wind ; so that they can bear all sorts, even those which belong to the plains.

Yet it is not strange that there should be some mountains which do not thus bear all things, but have a more special kind of vegetation to a great extent if not entirely ; for instance the range of Ida in Crete¹ ; for there the cypress grows ; or the hills of Cilicia and Syria, on which the Syrian cedar grows, or certain parts of Syria, where the terebinth grows. For it is the differences of soil which give a special character to the vegetation. ² (However the word 'special' is used here in a somewhat extended sense.)

Of mountain trees : of the differences found in wild trees.

III. The following trees are peculiar to mountain country and do not grow in the plains ; ³ let us take Macedonia as an example. Silver-fir fir 'wild pine' lime *zygia* Valonia oak box andrachne yew Phoenician cedar terebinth wild fig alaternus hybrid arbutus hazel chestnut kermes-oak. The following grow also in the plain : tamarisk elm abele willow black poplar cornelian cherry cornel alder oak *lakare* (bird-cherry) wild pear apple hop-hornbeam holly manna-ash Christ's thorn cotoneaster maple,⁴ which

¹ σφένδαμνος add. Palm. in view of what follows ; δένδαρα ἄκανθος UP Ald. Bas. ; ἄκανθος P₂.

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ὅρει πεφυκυῖαν ζυγίαν καλοῦσιν, ἐν δὲ τῷ πεδίῳ γλεῖνον. οἱ δὲ ἄλλως διαιροῦσι καὶ ἔτερον ποιοῦσιν εἶδος σφενδάμνου καὶ ζυγίας.

2 "Απαντα δὲ ὅσα κοινὰ τῶν ὄρῶν καὶ τῶν πεδίων, μείζω μὲν καὶ καλλίω τῇ ὅψει τὰ ἐν τοῖς πεδίοις γίνεται, κρείττω δὲ τῇ χρείᾳ τῇ τε τῶν ξύλων καὶ τῇ τῶν καρπῶν τὰ ὅρειν· πλὴν ἀχράδος καὶ ἀπίου καὶ μηλέας· αὗται δὲ ἐν τοῖς πεδίοις κρείττους οὐ μόνον τοῖς καρποῖς ἀλλὰ καὶ τοῖς ξύλοις· ἐν γὰρ τοῖς ὅρεσι μικραὶ καὶ ὀξώδεις καὶ ἀκανθώδεις γίνονται· πάντα δὲ καὶ ἐν τοῖς ὅρεσιν, ὅταν ἐπιλάβωνται τῶν οἰκείων τόπων, καὶ καλλίω φύεται καὶ εὐθενεῖ μᾶλλον· ὡς δὲ ἀπλῶς εἰπεῖν τὰ ἐν τοῖς διμαλέσι τῶν ὄρῶν καὶ μάλιστα, τῶν δὲ ἄλλων τὰ ἐν τοῖς κάτω καὶ κοίλοις· τὰ δὲ ἐπὶ τῶν ἄκρων χείριστα, πλὴν εἴ τι τῇ φύσει 3 φιλόψυχρον· ἔχει δὲ καὶ ταῦτ' αὖτις διαφορὰν ἐν τοῖς ἀνομοίοις τῶν τόπων, ὑπὲρ ὧν ὕστερον λεκτέον· νῦν δὲ διαιρετέον ἔκαστον κατὰ τὰς διαφορὰς τὰς εἰρημένας.

Αείφυλλα μὲν οὖν ἐστι τῶν ἀγρίων ἀ καὶ πρότερον ἐλέχθη, ἐλάτη πεύκη πίτυς ἀγρία πύξος ἀνδράχλη μίλος ἄρκευθος τέρμινθος φιλύκη ἀφάρκη δάφνη φελλόδρυς κήλαστρον ὀξυάκανθος πρῖνος μυρίκη· τὰ δὲ ἄλλα πάντα φυλλοβολεῖ· πλὴν εἴ τι περιττὸν ἐνιαχοῦ, καθάπερ ἐλέχθη περὶ τῆς ἐν τῇ Κρήτῃ πλατάνου καὶ δρυὸς καὶ εἴ που τόπος τις ὅλως εὔτροφος.

¹ δ' ἄλλως conj. Sch. from G; δ' αὖ Ald. ² Plin. 16. 77.

³ i.e. are not always of the poorest quality. ⁴ ταῦτα αὖτῶν Ald.H. ¹ 9. 3.

ENQUIRY INTO PLANTS, III. III. 1-3

when it grows in the mountains, is called *zygia*, when in the plain, *gleinos*: others however,¹ classify differently and make maple and *zygia* distinct trees.

² All those trees which are common to both hill and plain are taller and finer in appearance when they grow in the plain; but the mountain forms are better as to producing serviceable timber and fruits, with the exception of wild pear pear and apple; these are in the plain better in fruit and also in timber; for in the hills they grow small with many knots and much spinous wood. But even on the mountains all trees grow fairer and are more vigorous when they have secured a suitable position; and, to speak generally, those which grow on the level parts of the mountains are specially fair and vigorous; next to these come those which grow on the lower parts and in the hollows; while those that grow on the heights are of the poorest quality, except any that are naturally cold-loving. But even these shew some variation³ in different positions, of which we must speak later; for the present we must in our distinctions in each case take account only of the differences already mentioned.

Now among wild trees those are evergreen which were mentioned before,⁴ silver-fir fir 'wild pine' box andrachne yew Phoenician cedar terebinth alaternus hybrid arbutus bay *phellobrys*⁵ (holm-oak) holly cotoneaster kermes-oak tamarisk; but all the others shed their leaves, unless it be that in certain places they keep them exceptionally, as was said⁶ of the plane and oak in Crete and in any other place which is altogether favourable to luxuriant growth.

⁵ φελλόδρυς conj. Bod., cf. 1. 9. 3; φελλός δρῦς UMV(?) Ald.
⁶ 1. 9. 5.

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4 Κάρπιμα δὲ τὰ μὲν ἄλλα πάντα· περὶ δὲ ἵτεας καὶ αἰγείρου καὶ πτελέας, ὥσπερ ἐλέχθη, διαμφισ-βητοῦσιν. ἔνιοι δὲ τὴν αἰγειρὸν μόνην ἀκαρπεῖν φασιν, ὥσπερ καὶ οἱ ἐν Ἀρκαδίᾳ, τὰ δὲ ἄλλα πάντα τὰ ἐν τοῖς ὅρεσι καρποφορεῖν. ἐν Κρήτῃ δὲ καὶ αἰγειροὶ κάρπιμοι πλείους εἰσὶ· μία μὲν ἐν τῷ στομίῳ τοῦ ἄντρου τοῦ ἐν τῇ "Ιδῃ, ἐν φτὰ ἀναθήματα ἀνάκειται, ἄλλη δὲ μικρὰ πλησίον ἀπωτέρω δὲ μάλιστα δώδεκα σταδίους περί τινα κρήνην Σαύρου καλουμένην πολλαί. εἰσὶ δὲ καὶ ἐν τῷ πλησίον ὅρει τῆς "Ιδης ἐν τῷ Κινδρίῳ καλουμένῳ καὶ περὶ Πραισίαν δὲ ἐν τοῖς ὅρεσιν. οἱ δὲ μόνον τῶν τοιούτων τὴν πτελέαν κάρπιμον εἶναι φασι, καθάπερ οἱ περὶ Μακεδονίαν.

5 Μεγάλη δὲ διαφορὰ πρὸς καρπὸν καὶ ἀκαρπίαν καὶ ἡ τῶν τόπων φύσις, ὥσπερ ἐπὶ τε τῆς περσέας ἔχει καὶ τῶν φοινίκων· ἡ μὲν ἐν Αὐγύπτῳ καρποφορεῖ καὶ εἴ που τῶν πλησίον τόπων, ἐν Ῥόδῳ δὲ μέχρι τοῦ ἀνθεῖν μόνον ἀφικνεῖται. ὁ δὲ φοινιξ περὶ μὲν Βαβυλῶνα θαυμαστός, ἐν τῇ Ἑλλάδι δὲ οὐδὲ πεπαίνει, παρ' ἐνίοις δὲ ὅλως οὐδὲ προφαίνει καρπόν.

6 Ὁμοίως δὲ καὶ ἔτερα πλείω τοιαῦτ' ἔστιν· ἐπεὶ καὶ τῶν ἐλαττόνων ποαρίων καὶ ὑλημάτων ἐν τῇ

¹ 2. 2. 10.

² cf. 2. 2. 10. It appears that the buds of the poplar were mistaken for fruit (Sch.); cf. Diosc. I. 81. Later writers perpetuated the error by calling them *κόκκοι*.

³ τοῦ ἐν τῇ "Ιδῃ conj. Sch.; τοῦ ἐν τῷ "Ιδῃ U; τοῦ ἐν τῷ "Ιδης MV; ἐν τῇ "Ιδῃ Ald.H.

ENQUIRY INTO PLANTS, III. III. 4-6

Most trees are fruit-bearing, but about willow black poplar and elm men hold different opinions, as was said¹; and some, as the Arcadians, say that only the black poplar is without fruit, but that all the other mountain trees bear fruit. However in Crete there are a number of black poplars which bear fruit²; there is one at the mouth of the cave on mount Ida,³ in which the dedicatory offerings are hung, and there is another small one not far off, and there are quite a number about a spring called the Lizard's Spring about twelve furlongs off. There are also some in the hill-country of Ida in the same neighbourhood, in the district called Kindria and in the mountains about Praisia.⁴ Others again, as the Macedonians, say that the elm is the only tree of this class which bears fruit.

Again the character of the position makes a great difference as to fruit-bearing, as in the case of the *perseia*⁵ and the date-palm. The *perseia* of Egypt bears fruit, and so it does wherever it grows in the neighbouring districts, but in Rhodes⁶ it only gets as far as flowering. The date-palm in the neighbourhood of Babylon is marvellously fruitful; in Hellas it does not even ripen its fruit, and in some places it does not even produce any.

The same may be said of various other trees: in fact even⁷ of smaller herbaceous plants and bushes some are fruitful, others not, although the latter are

¹ Πραισίαν conj. Meurs. *Creta*; τιρασίαν U M V A L d.

² cf. 4. 2. 5. περσέαν conj. R. Const.; περσείας U; περσέας Ald.

³ Ρόδων conj. R. Const. from G, so too Plin. 16. 111; ρόα Ald. cf. 1. 13. 5. for a similar corruption.

⁴ ἐπειδεὶς καὶ conj. Sch. from G; ἐπειδὲ καὶ Ald.

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αὐτῇ χώρᾳ καὶ συνόρῳ χώρᾳ τὰ μὲν κάρπιμα τὰ δὲ ἄκαρπα γίνεται· καθάπερ καὶ τὸ κενταύριον ἐν τῇ Ἡλείᾳ, τὸ μὲν ἐν τῇ ὁρεινῇ κάρπιμον, τὸ δὲ ἐν τῷ πεδίῳ ἄκαρπον ἀλλὰ μόνον ἀνθεῖ, τὸ δὲ ἐν τοῖς κοίλοις τόποις οὐδὲ ἀνθεῖ πλὴν κακῶς. δοκεῖ δὲ οὖν καὶ τῶν ἀλλων τῶν ὁμογενῶν καὶ ἐν μιᾳ προσηγορίᾳ τὸ μὲν ἄκαρπον εἶναι τὸ δὲ κάρπιμον, οἷον πρῖνος ὁ μὲν κάρπιμος ὁ δὲ ἄκαρπος· καὶ 7 κλήθρα δὲ ὡσαύτως ἀνθεῖ δὲ ἀμφω. σχεδὸν δὲ ὅσα καλοῦσιν ἄρρενα τῶν ὁμογενῶν ἄκαρπα· καὶ τούτων τὰ μὲν πολλὰ ἀνθεῖν φασι τὰ δὲ ὀλίγον τὰ δὲ δλως οὐδὲ ἀνθεῖν· τὰ δὲ ἀνάπαλιν, τὰ μὲν ἄρρενα μόνα καρποφορεῖν, οὐ μὴν ἀλλ᾽ ἀπό γε τῶν ἀνθῶν φύεσθαι τὰ δένδρα, καθάπερ καὶ ἀπὸ τῶν καρπῶν ὅσα κάρπιμα· καὶ ἐν ἀμφοῖν οὕτως ἐνίοτε πυκνὴν εἶναι τὴν ἔκφυσιν ὥστε τοὺς ὄρεοτύπους οὐ δύνασθαι διεῖναι μὴ ὁδοποιησαμένους.

8 Ἐμφισθεῖται δὲ καὶ περὶ τῶν ἀνθῶν ἐνίων, ὥσπερ εἴπομεν. οἱ μὲν γὰρ καὶ δρῦν ἀνθεῖν οἴονται καὶ τὴν Ἡρακλεῶτιν καρύαν καὶ διοσβάλανον, ἔτι δὲ πεύκην καὶ πίτυν· οἱ δὲ οὐδὲν τούτων, ἀλλὰ τὸν ἰουλον τὸν ἐν ταῖς καρύαις καὶ τὸ βρύον τὸ δρύινον καὶ τὸν κύτταρον τὸν πιτύ-

¹ χώρᾳ καὶ Ald. ; η καὶ conj. St.

² i.e. the 'males' are sterile whether they flower or not. καὶ τούτων τὰ μὲν πολλὰ I conj.; τούτων τὰ πολλὰ τὰ μὲν Ald.

³ ? i.e. the flowers of the 'female' tree.

⁴ i.e. (a) in those trees whose 'male' form is sterile, whether it bears flowers or not; (b) in those whose 'male'

ENQUIRY INTO PLANTS, III. III. 6-8

growing in the same place as the former, or¹ quite near it. Take for instance the centaury in Elea; where it grows in hill-country, it is fruitful; where it grows in the plain, it bears no fruit, but only flowers; and where it grows in deep valleys, it does not even flower, unless it be scantily. Any way it appears that, even of other plants which are of the same kind and all go by the same name, one will be without fruit, while another bears fruit; for instance, one kermes-oak will be fruitful, another not; and the same is true of the alder, though both produce flowers. And, generally speaking, all those of any given kind which are called 'male' trees are without fruit, and that though² some of these, they say, produce many flowers, some few, some none at all. On the other hand they say that in some cases it is only the 'males' that bear fruit, but that, in spite of this, the trees grow from the flowers,³ (just as in the case of fruit-bearing trees they grow from the fruit). And they add that in both cases,⁴ the crop of seedlings⁵ which comes up is sometimes so thick that the woodmen cannot get through except by clearing a way.

There is also a doubt about the flower of some trees, as we said. Some think that the oak bears flowers, and also the filbert the chestnut and even the fir and Aleppo pine; some however think that none of these has a flower, but that,—resembling⁶ and corresponding to the wild figs which drop off prematurely, we have in the nuts the catkin,⁷ in the form alone bears fruit, but the fruit is infertile. The passage is obscure: W. gives up the text.

¹ ἔκφυσις. cf. 7. 4. 3.

² δύοιον conj. W.; δύοιαν UAld. cf. 3. 7. 3.

³ cf. 3. 5. 5.

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ἴνον ὅμοιον καὶ ἀνάλογον εἶναι τοῖς προαπο-
πτώτοις ἔρινοῖς. οἱ δὲ περὶ Μακεδονίαν οὐδὲ
ταῦτα φασιν ἀνθεῖν ἄρκευθον ὀξύην ἀρίαν σφέν-
δαμνον. ἔνιοι δὲ τὰς ἄρκεύθους δύο εἶναι, καὶ τὴν
μὲν ἑτέραν ἀνθεῖν μὲν ἄκαρπον δὲ εἶναι, τὴν δὲ
ἑτέραν οὐκ ἀνθεῖν μὲν καρπὸν δὲ φέρειν εὐθὺς
προφαινόμενον, ὥσπερ καὶ τὰς συκᾶς τὰ ἔρινά.
συμβαίνει δὲ οὖν ὥστε ἐπὶ δύο ἑτη τὸν καρπὸν
ἔχειν μόνον τοῦτο τῶν δένδρων. ταῦτα μὲν οὖν
ἐπισκεπτέον.

IV. Ἡ δὲ βλαστησις τῶν μὲν ἄμα γίνεται καὶ
τῶν ἡμέρων, τῶν δὲ μικρὸν ἐπιλειπομένη, τῶν δὲ
ἡδη πλέον, ἀπάντων δὲ κατὰ τὴν ἡρινὴν ὥραν.
ἀλλὰ τῶν καρπῶν ἡ παραλλαγὴ πλείων ὥσπερ
δὲ καὶ πρότερον εἴπομεν, οὐ κατὰ τὰς βλαστήσεις
αἱ πεπάνσεις ἀλλὰ πολὺ διαφέρουσιν ἐπεὶ καὶ
τῶν ὄψικαρποτέρων, ἂ δή τινές φασιν ἐνιαυτο-
φορεῖν, οἷον ἄρκευθον καὶ πρῖνον, ὅμως αἱ βλασ-
τήσεις τοῦ ἥρος. αὐτὰ δὲ αὐτῶν τὰ ὄμοιγενῆ τῷ
πρότερον καὶ ὑστερον διαφέρει κατὰ τοὺς τόπους·
πρῶτα μὲν γὰρ βλαστάνει τὰ ἐν τοῖς ἔλεσιν, ὡς
οἱ περὶ Μακεδονίαν λέγουσι, δεύτερα δὲ τὰ ἐν τοῖς
πεδίοις, ἔσχατα δὲ τὰ ἐν τοῖς ὄρεσιν.

2 Αὐτῶν δὲ τῶν καθ' ἔκαστα δένδρων τὰ μὲν

¹ i.e. the male flower, cf. Schol. on Ar. *Vesp.* 1111. Θεόφραστος κυρίως λέγει κύτταρον τὴν πράνθησιν τῆς πίτυος: but no explanation of such a use of the word suggests itself. cf. 3. 3. 8; 4. 8. 7.

² ἀρίαν conj. Sch., cf. 3. 4. 2; 3. 16. 3; 3. 17. 1; δέκινην ἀγρίαν Ald.

ENQUIRY INTO PLANTS, III. iii. 8-iv. 2

oak the oak-moss, in the pine the 'flowering tuft.'¹ The people of Macedonia say that these trees also produce no flowers—Phoenician cedar beech *aria*² (holm-oak) maple. Others distinguish two kinds of Phoenician cedar, of which one bears flowers but bears no fruit, while the other, though it has no flower, bears a fruit which shows itself at once³—just as wild figs produce their abortive fruit. However that may be,⁴ it is a fact that this is the only tree which keeps its fruit for two years. These matters then need enquiry.

Of the times of budding and fruiting of wild, as compared with cultivated, trees.

IV. Now the budding of wild trees occurs in some cases at the same time as that of the cultivated forms, but in some cases somewhat, and in some a good deal later; but in all cases it is during the spring season. But there is greater diversity in the time of fruiting; as we said before, the times of ripening do not correspond to those of budding, but there are wide differences. For even in the case of those trees which are somewhat late in fruiting,—which some say take a year to ripen their fruit—such as Phoenician cedar and kermes-oak, the budding nevertheless takes place in the spring. Again there are differences of time between individual trees of the same kind, according to the locality; those in the marshes bud earliest, as the Macedonians say, second to them those in the plains, and latest those in the mountains.

Again of particular trees some wild ones bud

³ i.e. without antecedent flower.

⁴ δ' οὐν conj. W.; σχεδὸν UMVAld.

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συναναβλαστάνει τοῖς ἡμέροις, οἷον ἀνδράχλη ἀφάρκη ἀχρᾶς δὲ μικρῷ ὕστερον τῆς ἀπίου. τὰ δὲ καὶ πρὸ ζεφύρου καὶ μετὰ πνοὰς εὐθὺν ζεφύρου. καὶ πρὸ ζεφύρου μὲν κρανεία καὶ θηλυκρανεία, μετὰ ζέφυρον δὲ δάφνη κλήθρα, πρὸ ἵσημερίας δὲ μικρὸν φίλυρα ζυγία φηγὸς συκῆ¹ πρωτβλαστα δὲ καὶ καρύα καὶ δρῦς καὶ ἀκτέος· ἔτι δὲ μᾶλλον τὰ ἄκαρπα δοκοῦντα καὶ ἀλσώδη, λεύκη πτελέα ἵτεα αἴγειρος· πλάτανος δὲ μικρῷ ὄψιαίτερον τούτων. τὰ δὲ ἄλλα ὥσπερ ἐνισταμένου τοῦ ἥρος, οἷον ἐρινεὸς φιλύκη ὁξυάκανθος παλίουρος τέρμινθος καρύα διοσβάλανος· μηλέα δ' ὄψιβλαστος· ὄψιβλαστότατον δὲ σχεδὸν ἵψος ἀρία τετραγωνία θύεια μίλος. αἱ μὲν οὖν βλαστήσεις οὕτως ἔχουσιν.

3 Αἱ δὲ ἀνθήσεις ἀκολουθοῦσι μὲν ὡς εἰπεῖν κατὰ λόγον, οὐ μὴν ἄλλὰ παραλλάττουσι, μᾶλλον δὲ καὶ ἐπὶ πλέον ἡ τῶν καρπῶν τελείωσις. κρανεία μὲν γὰρ ἀποδίδωσι περὶ τροπὰς θερινὰς ἡ πρώιος σχεδὸν ὥσπερ πρῶτον· ἡ δὲ ὄψιος, ἦν δή τινες καλοῦσι θηλυκρανείαν, μετ' αὐτὸν τὸ μετόπωρον· ἔστι δὲ ὁ ταύτης καρπὸς ἄβρωτος καὶ τὸ ξύλον ἀσθενὲς καὶ χαῦνον· τοσαύτη δὴ διαφορὰ περὶ 4 ἄμφω. τέρμινθος δὲ περὶ πυροῦ ἀμητὸν ἡ μικρῷ

¹ See below, n. 4.

² τὰ ἀκ. δοκ. καὶ ἀλσ. conj. W.; τὰ ἀκ. καὶ δοκ. καὶ ἀλσ. U MP; τὰ ἀκ. τὰ δοκ. ἀλσ. Ald.

³ ὥσπερ apologises for the unusual sense given to ἐνιστ.

ENQUIRY INTO PLANTS, III. iv. 2-4

along with the cultivated forms, as andrachne and hybrid arbutus ; and the wild pear is a little later than the cultivated. Some again bud both before zephyr begins to blow, and immediately after it has been blowing. Before it come cornelian cherry and cornel, after it bay and alder ; a little before the spring equinox come lime *zygia* Valonia oak fig. Hazel¹ oak and elder are also early in budding, and still more those trees which seem to have no fruit and to grow in groves,² abele elm willow black poplar ; and the plane is a little later than these. The others which bud when the spring is, as it were, becoming established,³ are such as wild fig alaternus cotoneaster Christ's thorn terebinth hazel⁴ chestnut. The apple is late in budding, latest of all generally are *ipsos*⁵ (cork-oak) *aria* (holm-oak) *tetragonia* odorous cedar yew. Such are the times of budding.

The flowering times in general follow in proportion ; but they present some irregularity, and so in still more cases and to a greater extent do the times at which the fruit is matured. The cornelian cherry produces its fruit about the summer solstice ; the early kind, that is to say, and this tree is about the earliest of all.⁶ The late form, which some call 'female cornelian cherry' (cornel), fruits quite at the end of autumn. The fruit of this kind is inedible and its wood is weak and spongy ; that is what the difference between the two kinds amounts to. The terebinth produces its fruit about the time of wheat-harvest or

(usually 'beginning'). τὰ δὲ ἄλλα ὥσπερ ἔνιστ. conj. W. ; τὰ δὲ ἄλλως περ' U ; τὰ δὲ ἄλλως περιενισταμένου MAld. H.

¹ καρύα can hardly be right both here and above.

² See Index.

³ σχεδὸν ὥσπερ πρῶτον not in G, nor in Plin. (16. 105) ; text perhaps defective.

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όψιαιτερον ἀποδίδωσι καὶ μελία καὶ σφένδαμνος τοῦ θέρους τὸν καρπόν κλήθρα δὲ καὶ καρύα καὶ ἀχράδων τι γένος μετοπώρου· δρῦς δὲ καὶ διοσβάλανος ὄψιαιτερον ἔτι περὶ Πλειάδος δύσιν, ώστα δὲ καὶ φιλύκη καὶ πρῦνος καὶ παλίουρος καὶ ὀξυάκανθος μετὰ Πλειάδος δύσιν· ή δὲ ἀρία χειμῶνος ἀρχομένου· καὶ ή μηλέα μὲν τοῖς πρώτοις ψύχεσιν, ἀχρὰς δὲ ὄψια χειμῶνος· ἀνδράχλη δὲ καὶ ἀφάρκη τὸ μὲν πρώτον πεπαίνουσιν ἀμα τῷ βότρυι περκάζοντι, τὸ δὲ ὕστερον, δοκεῖ γὰρ ταῦτα δίκαρπα, ἀρχομένου τοῦ χειμῶνος, ἐλάτη δὲ καὶ 5 μίλος ἀνθοῦσι μικρὸν πρὸ ἡλίου τροπῶν· [καὶ τῆς γε ἐλάτης τὸ ἄνθος κρόκινον καὶ ἄλλως καλόν·] τὸν δὲ καρπὸν ἀφιᾶσι μετὰ δύσιν Πλειάδος. πεύκη δὲ καὶ πίτυς προτεροῦσι τῇ βλαστήσει μικρόν, ὅσον πεντεκαίδεκα ἡμέραις, τοὺς δὲ καρποὺς ἀποδιδόσι μετὰ Πλειάδα κατὰ λόγον.

Ταῦτα μὲν οὖν μετριωτέραν μὲν ἔχει παραλλαγὴν· πάντων δὲ πλείστην ἡ ἄρκευθος καὶ ή κήλαστρος καὶ ή πρῦνος· ή μὲν γὰρ ἄρκευθος ἐνιαύσιον ἔχειν δοκεῖ· περικαταλαμβάνει γὰρ ὁ νέος τὸν περυσινόν. ώς δέ τινές φασιν, οὐδὲ πεπαίνει, δι' ὃ καὶ προαφαιροῦσι καὶ χρόνον τινὰ τηροῦσιν· ἐὰν δὲ ἔτι 6 ἐπὶ τοῦ δένδρου τις, ἀποξηραίνεται. φασὶ δὲ καὶ τὴν πρῦνον οἱ περὶ Ἀρκαδίαν ἐνιαυτῷ τελειοῦν· ἀμα γὰρ τὸν ἔνον πεπαίνει καὶ τὸν νέον ὑποφαίνει. ώστε τοῖς τοιούτοις συμβαίνει συνεχῶς τὸν καρπὸν ἔχειν. φασὶ δέ γε καὶ τὴν κήλαστρον ὑπὸ τοῦ

¹ ἀποδ. καὶ μελία U; ἀποδίδωσι· μελία Ald. Some confusion in text, but sense clear.

² ὄψια: ? ἄψια W.

ENQUIRY INTO PLANTS, III. iv. 4-6

a little later, manna-ash,¹ and maple in summer; alder, hazel and a certain kind of wild pear in autumn; oak and chestnut later still, about the setting of the Pleiad; and in like manner alaternus kermes-oak Christ's-thorn cotoneaster after the setting of the Pleiad; *aria* (holm-oak) when winter is beginning, apple with the first cold weather, wild pear late² in winter. Andrachne and hybrid arbutus first ripen their fruit when the grape is turning, and again³ when winter is beginning; for these trees appear to bear twice. As for⁴ silver-fir and yew, they flower a little before the solstice; ⁵(the flower of the silver-fir is yellow and otherwise pretty); they bear their fruit after the setting of the Pleiad. Fir and Aleppo pine are a little earlier in budding, about fifteen days, but produce their fruit after the setting of the Pleiad, though proportionately earlier than silver-fir and yew.

In these trees then the difference of time is not considerable; the greatest difference is shewn in Phoenician cedar holly and kermes-oak; for Phoenician cedar appears to keep its fruit for a year, the new fruit overtaking that of last year; and, according to some, it does not ripen it at all; wherefore men gather it unripe and keep it, whereas if it is left on the tree, it shrivels up. The Arcadians say that the kermes-oak also takes a year to perfect its fruit; for it ripens last year's fruit at the same time that the new fruit appears on it; the result of which is that such trees always have fruit on them. They say also

³ After *στρεπον* Ald. adds *ἀνθοῦντι* (so also H and G); Plin. 13. 121. omits it; om. W. after Sch.

⁴ *γὰρ* Ald.; *δὲ* conj. W.

⁵ Probably an early gloss, W. cf. Plin. 16. 106.

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χειμῶνος ἀποβάλλειν. ὁψίκαρπα δὲ σφόδρα καὶ φίλυρα καὶ πύξοι. [τὸν δὲ καρπὸν ἄβρωτον ἔχει παντὶ ζῷῳ φίλυρα θηλυκρανεία πύξοι. ὁψίκαρπα δὲ καὶ κιττὸς καὶ ἄρκευθος καὶ πεύκη καὶ ἀνδράχλη.] ὡς δὲ οἱ περὶ Ἀρκαδίαν φασίν, ἔτι τούτων ὁψίκαρπότερα σχεδὸν δὲ πάντων ὁψιαίτερα τετραγωνία θύεια μίλοις. αἱ μὲν οὖν τῶν καρπῶν ἀποβολαὶ καὶ πεπάνσεις τῶν ἀγρίων τοιαύτας ἔχουσι διαφορὰς οὐ μόνον πρὸς τὰ ἥμερα ἀλλὰ καὶ πρὸς ἑαυτά.

V. Συμβαίνει δ' ὅταν ἄρξωνται βλαστάνειν τὰ μὲν ἄλλα συνεχῆ τήν τε βλάστησιν καὶ τὴν αὔξησιν ποιεῖσθαι, πεύκην δὲ καὶ ἐλάτην καὶ δρῦν διαλείπειν, καὶ τρεῖς ὄρμὰς εἶναι καὶ τρεῖς ἀφιέναι βλαστούς, δι' ὃ καὶ τρίσλοποι· πᾶν γὰρ δὴ δένδρον ὅταν βλαστάνῃ λοπᾶ²· πρῶτον μὲν ἄκρους ἔαρος εὐθὺς ισταμένου τοῦ Θαργηλιῶνος, ἐν δὲ τῇ³ Ἰδῃ περὶ πεντεκαίδεκα μάλιστα ἥμέρας· μετὰ δὲ ταῦτα διαλιπόντα περὶ τριάκοντα ἡ μικρῷ πλείους ἐπιβάλλεται πάλιν ἄλλους βλαστούς ἀπ' ἄκρας τῆς κορυνήσεως τῆς ἐπὶ τῷ προτέρῳ βλαστῷ· καὶ τὰ μὲν ἄνω τὰ δ' εἰς τὰ πλάγια κύκλῳ ποιεῖται τὴν βλάστησιν, οἷον γόνυ

¹ φίλυρα Ald.; φιλυρέα conj. Sch.

² τὸν δὲ . . . ἀνδράχλη. Apparently a gloss, W.

³ τετραγωνία conj. Sch. (τετρα- omitted after -τερα): cf. § 2; γωνία MV; γωνία U.

⁴ τῶν ἀγρίων after πεπάνσεις conj. Sch.; after ἥμερα Ald.

⁵ Plin. 16. 100.

ENQUIRY INTO PLANTS, III. iv. 6-v. 1

that holly loses its fruit owing to the winter. Lime¹ and box are very late in fruiting, (lime has a fruit which no animal can eat, and so have cornel and box. Ivy Phoenician cedar fir and andrachne are late fruiting²) though, according to the Arcadians, still later than these and almost latest of all are *tetragonia*³ odorous cedar and yew. Such then are the differences as to the time of shedding and ripening their fruit between wild⁴ as compared with cultivated trees, and likewise as compared with one another.

Of the seasons of budding.

V. ⁵ Now most trees, when they have once begun to bud, make their budding and their growth continuously, but with fir silver-fir and oak there are intervals. They make three fresh starts in growth and produce three separate sets of buds; wherefore also they lose their bark thrice⁶ a year. For every tree loses its bark when it is budding. This first happens in mid-spring⁷ at the very beginning of the month Thargelion,⁸ on Mount Ida within about fifteen days of that time; later, after an interval of about thirty days or rather more, the tree⁹ puts on fresh buds which start from the head of the knobby growth¹⁰ which formed at the first budding-time; and it makes its budding partly on the top of this,¹¹ partly all round it laterally,¹² using the knob formed at the

¹ τρίσλωτοι conj. Sch.; τρίσλωτοι UM₂V; τρίσλεποι M₁Ald.
cf. 4. 15. 3; 5. 1. 1.

² ξαρός conj. R. Const.; ἀέρος V Ald. cf. Plin. l.c.

³ About May.

⁴ What follows evidently applies only to the oak.

⁵ κορυνησέως conj. Sch.; κορύνης ἔως UMV; κορυφῆς ἔως Ald.

⁶ cf. 3. 6. 2. ¹² τὰ add. Sch.

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ποιησάμενα τὴν τοῦ πρώτου βλαστοῦ κορύνην, ὥσπερ καὶ ἡ πρώτη βλάστησις ἔχει. γίνεται δὲ τοῦτο περὶ τὸν Σκιρροφοριῶνα λήγοντα.

2 Κατὰ δὲ ταύτην τὴν βλάστησιν καὶ ἡ κηκὶς φύεται πᾶσα, καὶ ἡ λευκὴ καὶ ἡ μέλαινα· φύεται δὲ ὡς ἐπὶ τὸ πολὺ νυκτὸς ἀθρόος· ἐφ' ἡμέραν δὲ μίαν αὐξηθεῖσα, πλὴν τῆς πιττοειδοῦς, ἐὰν ὑπὸ τοῦ καύματος ληφθῆ ξηραίνεται, καὶ ἀναυξῆς ἐπὶ τὸ μεῖζον, ἐγίνετο γὰρ ἀν μείζων τῷ μεγέθει. διόπερ τινὲς αὐτῶν οὐ μεῖζον ἔχουσι κυάμου τὸ μέγεθος. ἡ δὲ μέλαινα καὶ ἐπὶ πλείους ἡμέρας ἔγχλωρός ἐστι, καὶ αὐξάνονται καὶ λαμβάνουσιν ἔνιαι μέγεθος μῆλον.

Διαλείποντα δὲ μετὰ τοῦτο περὶ πεντεκαίδεκα ἡμέρας πάλιν τὸ τρίτον ἐπιβάλλεται βλαστοὺς 'Εκατομβαιῶνος, ἐλαχίστας ἡμέρας τῶν πρότερον¹ ἵσως γὰρ ἐξ ἣ ἐπτὰ τὸ πλεῖστον² ἡ δὲ βλάστησις ὁμοία καὶ τὸν αὐτὸν τρόπον. παρελθουσῶν δὲ τούτων οὐκέτι εἰς μῆκος ἀλλ' εἰς πάχος ἡ αὐξησις τρέπεται.

3 Πᾶσι μὲν οὖν τοῖς δένδροις αἱ βλαστήσεις φανεραί, μάλιστα δὲ τῇ ἐλάτῃ καὶ τῇ πεύκῃ διὰ τὸ στοιχεῖν τὰ γόνατα καὶ ἐξ ἵσου τοὺς ὅξους ἔχειν. ὥρα δὲ καὶ πρὸς τὸ τέμνεσθαι τὰ ἔντα τότε διὰ τὸ λοπᾶν³ ἐν γὰρ τοῖς ἄλλοις καιροῖς οὐκ εὐπεριαίρετος ὁ φλοιός, ἀλλὰ καὶ περιαιρέθεντος μέλαν τὸ ἔντα γίνεται καὶ τῇ ὅψει χειρον⁴ ἐπεὶ καὶ πρός γε τὴν χρείαν οὐδέν, ἀλλὰ καὶ

¹ About June.

² cf. 3. 7. 4; 3. 8. 6; Plin. 16. 27.

³ ἔγχλωρος conj. Coraës; εὐχλωρος Ald.

⁴ διαλείποντα conj. St.; διαλείπονται Ald. H.

ENQUIRY INTO PLANTS, III. v. 1-3

first budding as a sort of joint, just as in the case of the first budding. This happens about the end of the month Skirrophorion.¹

²(It is only at the time of this second budding that the galls also are produced, both the white and the black; the liquid forming them is mostly produced in quantity at night, and, after swelling for one day—except the part which is of resinous character—it hardens if it is caught by the heat, and so cannot grow any more; otherwise it would have grown greater in bulk; wherefore in some trees the formation is not larger than a bean. The black gall is for several days of a pale green³ colour; then it swells and sometimes attains the size of an apple.)

Then, after an interval⁴ of about fifteen days, the tree for the third time puts on buds in the month Hekatombaion⁵; but this growth continues for fewer days than on either of the previous occasions, perhaps for six or seven at most. However the formation of the buds is as before and takes place in the same manner. After this period there is no increase in length, but the only increase is in thickness.

The periods of budding can be seen in all trees, but especially in fir and silver-fir, because the joints of these are in a regular series and have the knots at even distances. It is then the season also for cutting the timber, because the bark is being shed⁶; for at other times the bark is not easy to strip off, and moreover, if it is stripped off, the wood turns black⁷ and is inferior in appearance; for as to its utility⁸ this makes no difference, though the wood

⁵ About July.

⁶ λοπᾶν conj. Sch.; λοιπᾶν UMV; λιπᾶν Ald.

⁷ cf. Plin. 16. 74.

⁸ γε conj. Sch.; τε Ald.

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ἰσχυρότερον, ἐὰν μετὰ τὴν πέπανσιν τῶν καρπῶν τμηθῇ.

4 Ταῦτα μὲν οὖν ἔδια τῶν προειρημένων δένδρων. αἱ δὲ βλαστήσεις αἱ ἐπὶ Κυνὶ καὶ Ἀρκτούρῳ γινόμεναι μετὰ τὴν ἔαριν ἡνὸν σχεδὸν κοιναὶ πάντων· ἔνδηλοι δὲ μᾶλλον ἐν τοῖς ἡμέροις καὶ τούτων μάλιστα συκῆ καὶ ἀμπέλῳ καὶ ῥοιῷ καὶ ὅλως ὅστα εὐτραφῆ καὶ ὅπου χώρα τοιαύτη· δι’ ὃ καὶ τὴν ἐπ’ Ἀρκτούρῳ πλείστην φασὶ γίνεσθαι περὶ Θετταλίαν καὶ Μακεδονίαν· ἅμα γὰρ συμβαίνει καὶ τὸ μετόπωρον καλὸν γίνεσθαι καὶ μακρόν, ὥστε καὶ τὴν μαλακότητα συμβάλλεσθαι τοῦ ἀέρος. ἐπεὶ καὶ ἐν Αἰγύπτῳ διὰ τοῦθ’ ὡς εἰπεῖν αἱεὶ βλαστάνει τὰ δένδρα, ἡ καὶ μικρόν τινα διαλείπει χρόνον.

5 Ἐλλὰ τὰ μὲν περὶ τὰς ἐπιβλαστήσεις, ὥσπερ εἱρηται, κοινά, τὰ δὲ περὶ τὰς διαλείψεις ἀπὸ τῆς πρώτης ἔδια τῶν λεχθέντων. ἔδιον δὲ ἐνίοις ὑπάρχει καὶ τὸ τῆς καλουμένης κάχρυος, οἷον τοῖς [τε] προειρημένοις· ἔχει γὰρ καὶ ἐλάτη καὶ πεύκη καὶ δρῦς, καὶ ἔτι φίλυρα καὶ καρύα καὶ διοσβάλανος καὶ πίτυς. αὗται δὲ γίνονται δρυτὸν πρὸ τῆς βλαστήσεως ὑποφαινούσης τῆς ἡρινῆς ὥρας. ἔστι δὲ ὥσπερεὶ κύνησις φυλλικὴ μεταξὺ πίπτουσα τῆς ἐξ ἀρχῆς ἐποιδήσεως καὶ τῆς φυλλικῆς βλαστήσεως· τῇ δὲ ὅῃ ἔστι τοῦ

¹ δένδρων conj. R. Const.; καρπῶν Ald. H.

² cf. C.P. 1. 10. 6; 1. 12. 4; 1. 13. 3; 1. 13. 5; 1. 13. 10; Plin. 16. 98. ³ cf. C.P. 1. 14. 11. ⁴ cf. 5. 1. 4; Plin. 16. 30.

ENQUIRY INTO PLANTS, III. v. 3-5

is stronger if it is cut after the ripening of the fruit.

Now what has been said is peculiar to the above-mentioned trees.¹ ² But the buddings which take place at the rising of the dog-star and at that of Arcturus after the spring budding are common to nearly all, though they may be most clearly seen in cultivated trees, and, among these, especially in fig vine pomegranate, and in general in all those that are luxuriant in growth or are growing in rich soil. Accordingly they say that the budding at the rising of Arcturus is most considerable in Thessaly and Macedonia³; for it also happens that the autumn in these countries is a fair and a long season; so that the mildness of the climate also contributes. Indeed it is for this reason, one may say, that in Egypt too the trees are always budding, or at least that the process is only suspended for quite a short time.

Now the facts as to the later buddings apply, as has been said, to all trees alike; but those which belong to the intervals after the first period of budding are peculiar to those mentioned above. Peculiar to some also is the growth of what are called 'winter buds,'⁴ for instance in the above-mentioned trees; silver-fir fir and oak have them, and also lime hazel chestnut and Aleppo pine. These are found in the oak before the leaf-buds grow, when the spring season is just beginning. This growth consists of a sort of leaf-like formation,⁵ which occurs between the first swelling of the leaf-buds and the time when they burst into leaf. In the sorb⁶ it

¹ ἔστι . . . φυλλική: ἔστι conj. R. Const.; ὁσπερεί conj. Sch.; ἔτι δὲ ὁσπερή κύνησις φυλακή U Ald. H.; φυλλική m Bas. etc.

² τῇ δὲ ὅρᾳ ἔστι conj. W. (cf. the description of ὅη, 3. 12. 8); τῇ δὲ ἰδιότητι Ald.

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μετοπώρου μετὰ τὴν φυλλοβολίαν εὐθὺς λιπαρά τις καὶ ὕσπερ ἐπωδηκυῖα, καθαπερανεὶ μέλλουσα βλαστάνειν, καὶ διαμένει τὸν χειμῶνα μέχρι τοῦ ἥρος. ἡ δὲ Ἡρακλεωτικὴ μετὰ τὴν ἀποβολὴν τοῦ καρποῦ φύει τὸ βοτρυῶδες ἥλικον σκώληξ εὐμεγέθης, ἐξ ἑνὸς μίσχου πλείω δή, ἀ καλοῦσί τινες ⁶ ιούλους. τούτων ἔκαστον ἐκ μικρῶν σύγκειται μορίων φοιλιδωτῶν τῇ τάξει, καθάπερ οἱ στρόβιλοι τῆς πεύκης, ὥστε μὴ ἀνομοίαν εἶναι τὴν ὄψιν στροβίλῳ νέῳ καὶ χλωρῷ πλὴν προμηκέστερον καὶ σχεδὸν ἴσοπαχες διόλου. τοῦτο δὲ αὐξεται τὸν χειμῶνα· (καὶ ἄμα τῷ ἥρι χάσκει τὰ φοιλιδωτὰ καὶ ξανθὰ γίνεται), καὶ τὸ μῆκος λαμβάνει καὶ τριδάκτυλον· ὅταν δὲ τοῦ ἥρος τὸ φύλλον βλαστάνῃ, ταῦτ' ἀποπίπτει καὶ τὰ τοῦ καρύου καλυκώδη περικάρπια γίνεται συμμεμυκότα κατὰ τοῦ μίσχου, τοσαῦτα ὅσα καὶ ἦν τὰ ἄνθη· τούτων δ' ἐν ἔκαστῳ κάρυον ἔν. περὶ δὲ τῆς φιλύρας ἐπισκεπτέον, καὶ εἴ τι ἄλλο καχρυοφόρον.

VI. Ἐστι δὲ καὶ τὰ μὲν εὐαυξῆτα δὲ δυσαυξῆτα. εὐαυξῆτα μὲν τά τε πάρυδρα, οἷον πτελέα πλάτανος λεύκη αἴγειρος ἵτεα· καί τοι περὶ ταύτης ἀμφισβητοῦσί τινες ὡς δυσαυξεοῦσι· καὶ τῶν καρποφόρων δὲ ἐλάτη πεύκη δρῦς. εὐαυξέστατον δὲ . . . μίλος

¹ εὐθὺς λιπαρὰ conj. Sch.; τις add. W.; εὐθὺς αἱ παρὰ τῆς U.

² φύει conj. W.; φύεται Ald. ³ i.e. catkins. cf. 3. 3. 8.

⁴ πλείω δή conj. Sch.; πιώδη UMVAld.; πλείονα U ?.

⁵ cf. 3. 10. 4.

⁶ συμμεμυκότα κατὰ τοῦ μ.: G evidently had a different text; ? συμπεφυκότα W.

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occurs in the autumn after the shedding of the leaves, and has from the first a glistening look,¹ as though swelling had taken place, just as if it were about to burst into leaves; and it persists through the winter till the spring. The filbert after casting its fruit produces² its clustering growth,³ which is as large as a good-sized grub: several⁴ of these grow from one stalk, and some call them catkins. Each of these is made up of small processes arranged like scales, and resembles the cone of the fir, so that its appearance is not unlike that of a young green fir-cone, except that it is longer and almost of the same thickness throughout. This grows through the winter (when spring comes, the scale-like processes open and turn yellow); it grows to the length of three fingers, but, when in spring the leaves are shooting, it falls off, and the cup-like⁵ fruit-cases of the nut are formed, closed all down⁶ the stalk and corresponding⁷ in number to the flowers; and in each of these is a single nut. The case of the lime and of any other tree that produces winter-buds needs further consideration.

Of the comparative rate of growth in trees, and of the length of their roots.

VI. Some trees are quick-growing, some slow. Quick-growing are those which grow by the waterside, as elm plane abele black poplar willow; (however some dispute about the last-named, and consider it a slow grower:) and of fruit-bearing trees, silver-fir fir oak. Quickest growing of all are . . .⁸ yew *lakara*

⁷ δσα καὶ ἡν τὰ ἀνθη conj. W.; δσα καὶ κατὰ ἀνθη Ald.

⁸ Lacuna in text (Sch. W.). The following list of trees also appears to be in confusion, and includes some of both classes.

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καὶ λάκαρα φηγὸς ἄρκευθος σφένδαμνος ὁστρύα
ζυγία μελία κλήθρα πίτυς ἀνδράχλη κρανεία
πύξος ἀχράς. καρποφορεῖ δὲ εὐθὺς ἐλάτη πεύκη
πίτυς, καὶ ὁπηλικονοῦν μέγεθος λάβωσιν.

2 Ἡ δὲ αὔξησις καὶ ἡ βλαστησις τῶν μὲν ἄλλων
ἄτακτος κατὰ τὸν τόπους τῶν βλαστῶν, τῆς δὲ
ἐλάτης ὡρισμένη καὶ συνεχὴς καὶ ὑστερον. ὅταν
γὰρ ἐκ τοῦ στελέχους τὰ πρῶτα σχισθῇ, πάλιν ἐξ
ἐκείνου ἡ ἐτέρα σχίσις γίνεται κατὰ τὸν αὐτὸν
τρόπον, καὶ τοῦτ' ἀεὶ ποιεῖ κατὰ πάσας τὰς ἐπι-
βλαστήσεις. ἐν δὲ τοῖς ἄλλοις οὐδὲ οἱ ὅζοι κατ'
ἄλληλους πλὴν ἐπὶ τινων ὀλίγων, οἷον κοτίνου
καὶ ἄλλων· ἔχει δὲ καὶ τῇδε διαφορὰν ἡ αὔξησις
κοινῇ πάντων ὁμοίως ἡμέρων τε καὶ ἀγρίων· τὰ
μὲν γὰρ καὶ ἐκ τοῦ ἄκρου τῶν βλαστῶν καὶ ἐκ
τῶν πλαγίων φύεται, καθάπερ ἄπιος ρόα συκῆ
μύρρινος σχεδὸν τὰ πλεῖστα· τὰ δὲ ἐκ τοῦ ἄκρου
μὲν οὐκ ἀνίησιν ἐκ δὲ τῶν πλαγίων, καὶ αὐτὸ
προωθεῖται τὸ ὑπάρχον, ὥσπερ καὶ τὸ ὅλον στέ-
λεχος καὶ οἱ ἀκρεμόνες. συμβαίνει δὲ τοῦτο ἐπὶ
τῆς Περσικῆς καρύας καὶ τῆς Ἡρακλεωτικῆς καὶ
3 ἄλλων. ἀπάντων δὲ τῶν τοιούτων εἰς ἐν φύλλον
ἀποτελευτῶσιν οἱ βλαστοί, δι' ὃ καὶ εὐλόγως οὐκ
ἐπιβλαστάνει καὶ αὐξάνεται μὴ ἔχοντα ἀρχήν.
(όμοία δὲ τρόπον τινὰ ἡ αὔξησις καὶ τοῦ σίτου·

¹ κατὰ . . . βλαστῶν conj. W.; κατὰ τοὺς τρόπους (corrected
το τόπους) καὶ βλαστούς U; MVP insert τοὺς before βλαστούς.

² ἐκείνου . . . κατὰ conj. W.; ἐκείνου ἡ ἐτέρα σχίσεται τὰ ἵσα
καὶ U Ald.

³ ἄλλων: ? ἐλάς W.; I suggest ἄλλων ἐλαῶν.

(bird-cherry) Valonia oak Phoenician cedar maple hop-hornbeam *zygia* manna-ash alder Aleppo pine andrachne cornelian cherry box wild pear. But silver-fir fir and Aleppo pine bear fruit from the very first, whatever size they have attained.

While the growth and budding of most trees are irregular as regards the position in which the buds appear,¹ the growth and budding of the silver-fir follow a regular rule, and its development afterwards is also in a regular sequence. For, when the trunk first divides, then again from the divided trunk the second division² takes place in like manner, and so the tree goes on with each fresh formation of buds. In other trees not even the knots are opposite to one another, except in some few cases, as wild olive and others.³ Here too we find a difference in the manner of growth which belongs to all trees alike, both cultivated and wild: in some cases the growth is from the top of the shoots and also from the side-buds,⁴ as in pear pomegranate fig myrtle and the majority of trees, one may say: in some cases the growth is not from the top, but only from the side-buds, and the already existing part is pushed out⁵ further, as is the whole trunk with the upper branches. This occurs in the walnut and in the filbert as well as in other trees. In all such trees the buds end in a single leaf⁶; wherefore it is reasonable that they should not make fresh buds and growth from this point, as they have no point of departure. (To a certain extent the growth of corn is similar; for it

¹ ἐκ τοῦ . . . πλαγίων: ? ἐκ τοῦ ἄκρου καὶ ἐκ τῶν πλαγίων βλαστῶν. cf. 3. 5. 1.

² i.e. grows without dividing. cf. Plin. 16. 100. (of different trees).

³ φύλλον perhaps conceals some other word.

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καὶ γὰρ οὗτος ἀεὶ τῇ προώσει τοῦ ὑπάρχοντος αὐξάνεται, κανὸν κολοβωθῆ τὰ φύλλα, καθάπερ ἐν τοῖς ἐπιβοσκομένοις· πλὴν οὗτος γε οὐκ ἐκ τοῦ πλαγίου παραφύει, καθάπερ ἔνια τῶν χεδροπῶν.) αὗτη μὲν οὖν διαφορά τις ἀν εἴη βλαστήσεως ἄμα καὶ αὐξήσεως.

4 Βαθύρριζα δὲ οὐ φασί τινες εἶναι τὰ ἄγρια διὰ τὸ φύεσθαι πάντα ἀπὸ σπέρματος, οὐκ ἄγαν ὄρθως λέγοντες. ἐνδέχεται γὰρ ὅταν ἐμβιώσῃ πόρρω καθίεναι τὰς ρίζας· ἐπεὶ καὶ τῶν λαχάνων τὰ πολλὰ τοῦτο ποιεῖ, καίπερ ἀσθενέστερα ὄντα καὶ ἐναργῶς φυόμενα <ἐν> τῇ γῇ. Βαθυρριζότατον δ' οὖν δοκεῖ τῶν ἄγριων εἶναι ἡ πρῖνος· ἐλάτη δὲ καὶ πεύκη μετρίως, ἐπιπολαιότατον δὲ θραύπαλος καὶ κοκκυμηλέα καὶ σποδιάς· αὕτη δ' ἐστὶν ὥσπερ ἄγρια κοκκυμηλέα. ταῦτα μὲν οὖν καὶ ὀλιγόρριζα· ὁ δὲ θραύπαλος πολύρριζον. συμβαίνει δὲ τοῖς ἄλλοις τοῖς μὴ κατὰ βάθους ἔχουσι, καὶ οὐχ ἡκιστα ἐλάτη καὶ πεύκη, προρρίζοις ὑπὸ τῶν πνευμάτων ἐκπίπτειν.

5 Οἱ μὲν οὖν περὶ Ἀρκαδίαν οὕτω λέγουσιν. οἱ δ' ἐκ τῆς Ἰδης βαθυρριζότερον ἐλάτην δρυὸς ἀλλ' ἐλάττους ἔχειν καὶ εὐθυρριζότεραν εἶναι· βαθυρριζότατον δὲ καὶ τὴν κοκκυμηλέαν καὶ τὴν Ἡρακλεωτικήν, τὰς δὲ ρίζας λεπτὰς καὶ ἴσχυρὰς τὴν Ἡρακλεωτικήν, τὴν δὲ κοκκυμηλέαν πολύρριζον, ἄμφω δ' ἐμβιῶναι δεῖν· δυσώλεθρον δὲ τὴν κοκκυμηλέαν. ἐπιπολῆς δὲ σφένδαμνον καὶ

¹ τοῦ ὑπάρχοντος conj. Sch. from G; τῇ ὑπαρχούσῃ Ald.

² οὐδ': ? οὐκ W. ³ Plin. 16. 127.

⁴ ἐμβιώσῃ: cf. 3. 6. 5; C.P. 1. 2. 1.

ENQUIRY INTO PLANTS, III. vi. 3-5

also regularly increases by pushing forward of the already existing part,¹ even if the leaves are mutilated, as in corn which is bitten down by animals. Corn however does not² make side-growths, as some leguminous plants do.) Here then we may find a difference which occurs both in the making of buds and in the making of fresh growth.

³ Some say that wild trees are not deep rooting, because they all grow from seed; but this is not a very accurate statement. For it is possible that, when they are well established,⁴ they may send their roots down far; in fact even most pot-herbs do this, though these are not so strong as trees, and are undoubtedly grown from seed planted in the ground.⁵ The kermes-oak however seems to be the deepest rooting of wild trees; silver-fir and fir are only moderately so, and shallowest are joint-fir plum bullace (which is a sort of wild plum). The last two also have few roots, while joint-fir has many. Trees which do not root deep,⁶ and especially silver-fir and fir, are liable to be rooted up by winds.

So the Arcadians say. But the people who live near Mount Ida say that the silver fir is deeper rooting⁷ than the oak,⁸ and has straighter roots, though they are fewer. Also that those which have the deepest roots are plum and filbert, the latter having strong slender roots, the former having many: but they add that both trees must be well established to acquire these characters; also that plum is very tenacious of life. Maple, they say,

⁵ ἐναργῶς . . . γῆ: so G; ἐν add. W.

⁶ Βάθεος conj. Sch.; Βάθος Ald.

⁷ Βαθυπριζότερον conj. W.; Βαθυπριζότατον UMVAld.

⁸ Proverbial for its hold on the ground; cf. Verg. *Aen.* 4. 441 foll.

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δόλίγας· τὴν δὲ μελίαν πλείους καὶ εἶναι πυκνόρριζον καὶ βαθύρριζον. ἐπιπολῆς δὲ καὶ ἄρκευθον καὶ κέδρον· καὶ κλήθρας λεπτὰς καὶ ὄμαλεῖς· ἔτι δ' ὁξύην· καὶ γὰρ τοῦτ' ἐπιπολαιόρριζον καὶ ὀλιγόρριζον. τὴν δὲ οὖαν ἐπιπολαίους μὲν ἵσχυρὰς δὲ καὶ παχείας καὶ δυσωλέθρους πλήθει δὲ μετρίας. βαθύρριζα μὲν οὖν καὶ οὐ βαθύρριζα τὰ τοιαῦτ' ἐστίν.

VII. Ἀποκοπέντος δὲ τοῦ στελέχους τὰ μὲν ἄλλα πάνθ' ὡς εἰπεῖν παραβλαστάνει, πλὴν ἐὰν αἱ ρίζαι πρότερον τύχωσι πεπονηκυῖαι· πεύκη δὲ καὶ ἐλάτη τελέως ἐκ ρίζῶν αὐτοετεῖς αὐάινονται καὶ ἐὰν τὸ ἄκρον ἐπικοπῆ. συμβαίνει δὲ ἵδιόν τι περὶ τὴν ἐλάτην· ὅταν γὰρ κοπῆ ἡ κολουσθῆ ὑπὸ πνεύματος ἡ καὶ ἄλλου τινὸς περὶ τὸ λεῖον τοῦ στελέχους—ἔχει γὰρ μέχρι τινὸς λεῖον καὶ ἀοζον καὶ ὄμαλὸν ἵκανὸν ἵστρῳ πλοίου—περιφύεται μικρόν, ὑποδεέστερον εἰς ὕψος, καὶ καλούσιν οἱ μὲν ἄμφαυξιν οἱ δὲ ἄμφιφυαν, τῷ μὲν χρώματι μέλαν τῇ δὲ σκληρότητι ὑπερβάλλον, ἐξ οὐ τοὺς κρατήρας ποιοῦσιν οἱ περὶ Ἀρκαδίαν.
2 τὸ δὲ πάχος οἰον ἀν τύχῃ τὸ δένδρον, ὅσφπερ ἀν ἵσχυρότερον καὶ ἐγχυλότερον ἡ παχύτερον. συμβαίνει δὲ κάκεῦνο ἵδιον ἐν ταύτῳ τούτῳ περὶ

¹ σφ. καὶ δλίγας conj. W.; σφ. κατ' δλίγον UΜV Ald.

² i.e. not very fibrous.

³ cf. Hdt. 6. 37, and the proverb πίτυος τρόπον ἐκτρίβεσθαι.

⁴ δμαλον conj. Scal.; δμοιον Ald.

⁵ ἵκανὸν ἵστρῳ πλοίον conj. W.; ἡ καὶ ἡλίκον πλεῖον Ald.; so UH, but with πλοῖον.

has shallow roots and few of them¹; but manna-ash has more and they are thickly matted and run deep; Phoenician cedar and prickly cedar, they say, have shallow roots, those of alder are slender and 'plain,'² as also are those of beech; for this too has few roots, and they are near the surface. Sorb, they say, has its roots near the surface, but they are strong and thick and hard to kill, though not very numerous. Such are the trees which are or are not deep-rooting.

Of the effects of cutting down the whole or part of a tree.

VII. Almost all trees shoot from the side if the trunk is cut down, unless the roots have previously been injured; but fir and silver-fir wither away³ completely from the roots within the year, if merely the top has been cut off. And there is a peculiar thing about the silver-fir; when it is topped or broken off short by wind or some other cause affecting the smooth part of the trunk—for up to a certain height the trunk is smooth knotless and plain⁴ (and so suitable for making a ship's mast⁵),—a certain amount of new growth forms round it, which does not however grow much vertically; and this is called by some *amphautis*⁶ and by others *amphiphyta*⁶; it is black in colour and exceedingly hard, and the Arcadians make their mixing-bowls out of it; the thickness is in proportion⁷ to the tree, according as that is more or less vigorous and sappy, or again according to its thickness. There⁸ is this peculiarity too in the silver-fir in the same connexion;

¹ Two words meaning 'growth about,' i.e. *callus*.

² οἵον ἀν conj. W.; οἵον ἀν Ald.; δοῖον ἀν conj. Scal.

³ Plin. 16. 123.

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τὴν ἐλάτην· ὅταν μὲν γάρ τις τοὺς ὅξους ἀπαυτας ἀφελὼν ἀποκόψῃ τὸ ἄκρον, ἀποθνήσκει ταχέως· ὅταν δὲ τὰ κατωτέρω τὰ κατὰ τὸ λεῖον ἀφέλῃ, ζῆ τὸ κατάλοιπον, περὶ δὲ δὴ καὶ ἡ ἀμφαυξεῖς φύεται. ζῆ δὲ δῆλον ὅτι τῷ ἔγχυλον εἴναι καὶ χλωρόν, εἴπερ ἀπαράβλαστον. ἀλλὰ γὰρ τοῦτο μὲν ἴδιον τῆς ἐλάτης.

3 Φέρει δὲ τὰ μὲν ἄλλα τόν τε καρπὸν τὸν ἑαυτῶν καὶ τὰ κατ' ἐνιαυτὸν ἐπιγινόμενα ταῦτα, φύλλον ἄνθος βλαστόν· τὰ δὲ καὶ βρύον ἡ ἐλικατὰ δὲ πλείω, καθάπερ ἡ τε πτελέα τόν τε βότρυν καὶ τὸ θυλακῶδες τοῦτο, καὶ συκῆ καὶ τὰ ἐρινὰ τὰ προαποπίπτοντα καὶ εἴ τινες ἄρα τῶν συκῶν ὀλυνθοφοροῦσιν. ἵσως δὲ τρόπον τινὰ καρπὸς οὗτος. ἀλλ' ἡ Ἡρακλεωτικὴ καρύα τὸν ἴουλον καὶ ἡ πρῖνος τὸν φοινικοῦν κόκκον ἡ δὲ δάφνη τὸ βότρυνον. φέρει μὲν καὶ ἡ καρποφόρος, εἰ μὴ καὶ πᾶσα ἄλλα τοι γένος τι αὐτῆς, οὐ μὴν ἄλλα πλέον ἡ ἄκαρπος, ἦν δὴ καὶ ἄρρενά τινες καλοῦσιν. ἀλλ' ἡ πεύκη τὸν προαποπίπτοντα κύταρον.

4 Πλεῖστα δὲ πάντων ἡ δρῦς παρὰ τὸν καρπόν, οἷον τὴν τε κηκίδα τὴν μικρὰν καὶ τὴν ἑτέραν

¹ i.e. and so does not, like other trees under like treatment, put its strength into these. cf. C.P. 5. 17. 4.

² ἑαυτῶν conj. Sch. from G; αὐτὸν Ald.

³ The leaf-gall, cf. 2. 8. 3; 3. 14. 1. For τοῦτο cf. 3. 18. 11; 4. 7. 1.

⁴ Iat. grossi. cf. C.P. 5. 1. 8.

⁵ τινὰ καρπὸς conj. Sch.; τινὰ ἄκαρπος UAld.

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when, after taking off all the branches, one cuts off the top, it soon dies ; yet, when one takes off the lower parts, those about the smooth portion of the trunk, what is left survives, and it is on this part that the *amphaxis* forms. And plainly the reason why the tree survives is that it is sappy and green because it has no side-growths.¹ Now this is peculiar to the silver-fir.

Of other things borne by trees besides their leaves flowers and fruit.

Now, while other trees bear merely their own² fruit and the obvious parts which form annually, to wit, leaf flower and bud, some bear also catkins or tendrils, and some produce other things as well, for instance the elm its 'cluster' and the familiar bag-like thing,³ the fig both the immature figs which drop off and (in some kinds) the untimely figs⁴—though perhaps in a sense⁵ these should be reckoned as fruit. Again filbert produces its catkin,⁶ kermes-oak its scarlet 'berry,'⁷ and bay its 'cluster.'⁸ The fruit-bearing sort of bay also produces this, or at all events⁹ one kind certainly does so ; however the sterile kind, which some call the 'male,' produces it in greater quantity. The fir again bears its 'tuft,'¹⁰ which drops off.

¹¹ The oak however bears more things besides¹² its fruit than any other tree ; as the small gall¹³ and its

⁶ cf. 3. 3. 8 ; 3. 5. 5.

⁷ cf. 3. 16. 1. i.e. the kermes gall (whence Eng. 'crimson').

⁸ *βότρυον* UMVAld., supported by G. and Plin. 16. 120 ; but some editors read *βρύον* on the strength of 3. 11. 4. and C.P. 2. 11. 4. ⁹ ἀλλὰ τοι conj. W. ; ἀλλὰ καὶ Ald.

¹⁰ cf. 3. 3. 8 n. ¹¹ Plin. 16. 28.

¹² *παρδ* conj. W., cf. § 6 ; *φέρει* Ald.

¹³ cf. 3. 5. 2.

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τὴν πιττώδη μέλαιναν. ἔτι δὲ συκαμινῶδες ἄλλο τῇ μορφῇ πλὴν σκληρὸν καὶ δυσκάτακτον, σπάνιον δὲ τοῦτο· καὶ ἔτερον αἰδοιώδη σχέσιν ἔχον, τελειούμενον δ' ἔτι σκληρὸν κατὰ τὴν ἐπανάστασιν καὶ τετρυπημένον προσεμφερὲς τρόπον τινὰ τοῦτ' ἔστι καὶ ταύρου κεφαλῆ, περικαταγνύμενον δὲ ἔνδοθεν ἔχει πυρῆνος ἐλάσιονφύεις. φύει δὲ καὶ τὸν ὑπὸ ἐνίων καλούμενον πῖλον· τοῦτο δ' ἔστι σφαιρίον ἐριώδες μαλακὸν περὶ πυρῆνος σκληρότερον πεφυκός, ὡς χρῶνται πρὸς τὸν λύχνον· καὶ εται γὰρ καλῶς, ὥσπερ καὶ ἡ μέλαινα κηκίς. φύει δὲ καὶ ἔτερον σφαιρίον κόμην ἔχον, τὰ μὲν ἄλλα ἀχρεῖον, κατὰ δὲ τὴν ἔαριν ὥραν ἐπίβαπτον χυλῷ μελιτηρῷ καὶ κατὰ τὴν ἀφῆν καὶ κατὰ τὴν γεῦσιν.

5 Παραφύει δ' ἔνδοτέρω τῆς τῶν ῥαβδῶν μασχαλίδος ἔτερον σφαιρίον ἄμισχον ἥ καὶ κοιλόμισχον ἴδιον καὶ ποικίλον· τὸν μὲν γὰρ ἐπανεστηκοτας ὁμφαλοὺς ἐπιλεύκους ἥ ἐπεστιγμένους ἔχει μέλαινας τὸ δ' ἀνὰ μέσον κοκκοβαφὲς καὶ λαμπρόν· ἀνοιγόμενον δ' ἔστι μέλαν καὶ ἐπίσαπρον. σπάνιον δὲ παραφύει καὶ λιθάριον κισσηροειδὲς ἐπὶ πλεῖον. ἔτι δ' ἄλλο τούτου σπανιαίτερον φυλλικὸν συμπεπιλημένον πρόμηκες σφαιρίον. ἐπὶ δὲ τοῦ φύλλου φύει κατὰ τὴν ῥάχιν σφαιρίον λευκὸν διαυγὲς ὑδατῶδες, ὅταν ἀπαλὸν ἥ· τοῦτο δὲ καὶ

¹ πυρῆνος ἐλάσιονφύεις conj. W.; πυρῆνος ἐλαίᾳ εἰρουφυην U M V; πυρῆνα ἐλαίᾳ εἰρουφύην Ald.

² περὶ πυρῆνος σκληρότερον I conj.; περὶ πυρῆνος σκληρότητα U; περὶ πυρῆνος σκληρότερον M; περὶ πυρῆνος σκληρότερον V Ald. W. prints the reading of U. For πῖλος see Index.

other black resinous gall. Again it has another growth, like a mulberry in shape, but hard and difficult to break ; this however is not common. It has also another growth like the *penis* in shape, which, when it is further developed, makes a hard prominence and has a hole through it. This to a certain extent resembles also a bull's head, but, when split open, it contains inside a thing shaped like the stone of an olive.¹ The oak also produces what some call the 'ball' ; this is a soft woolly spherical object enclosing a small stone which is harder,² and men use it for their lamps ; for it burns well, as does the black gall. The oak also produces another hairy ball, which is generally useless, but in the spring season it is covered with a juice which is like honey both to touch and taste.

³ Further the oak produces right inside the axil⁴ of the branches another ball with no stalk or else⁵ a hollow one ; this is peculiar and of various colours : for the knobs which arise on it are whitish or black and spotted,⁶ while the part between these is brilliant scarlet ; but, when it is opened, it is black and rotten.⁷ It also occasionally produces a small stone which more or less resembles pumice-stone ; also, less commonly, there is a leaf-like ball, which is oblong and of close texture. Further the oak produces on the rib of the leaf a white transparent ball, which is watery, when it is young ; and this sometimes con-

¹ Plin. 16. 29.

² ἐνδοτέρω . . . μασχαλίδος conj. R. Const. ; ἐντεριώνης τῶν δοκῶν μασχαλίδας U Ald. Plin., l.c., *gignunt et alae ramorum eius pilulas.* ⁵ ή ins. St.

⁶ Plin., l.c., *nigra varietate dispersa.*

⁷ ἐπίσπαρον ; Plin., l.c., *has apertis amara inanitas est,* whence ἐπίπικρον conj. Sch.

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μύας ἐνίοτε ἐνδὸν ἵσχει. τελειούμενον δὲ σκληρύνεται κηκίδος μικρᾶς λείας τρόπον.

6 Ἡ μὲν οὖν δρῦς τοσαῦτα φέρει παρὰ τὸν καρπόν. οἱ γὰρ μύκητες ἀπὸ τῶν ρίζῶν καὶ παρὰ τὰς ρίζας φυόμενοι κοινοὶ καὶ ἐτέρων εἰσὶν. ώσαύτως δὲ καὶ ἡ ἵξια· καὶ γὰρ αὐτῇ φύεται καὶ ἐν ἄλλοις· ἀλλ’ οὐδὲν ἥττου, ὥσπερ ἐλέχθη, πλειστοφόρον ἐστίν· εἰ δέ γε δὴ καθ’ Ἡσίοδον φέρει μέλι καὶ μελίττας, ἔτι μᾶλλον· φαίνεται δ’ οὖν καὶ ὁ μελιτώδης οὗτος χυλὸς ἐκ τοῦ ἀέρος ἐπὶ ταύτῃ μάλιστα προσίζειν. φασὶ δὲ καὶ ὅταν κατακαυθῇ γίνεσθαι λίτρον ἐξ αὐτῆς. ταῦτα μὲν οὖν ἴδια τῆς δρυός.

VIII. Πάντων δέ, ὥσπερ ἐλέχθη, τῶν δένδρων ώς καθ’ ἔκαστον γένος λαβεῖν διαφορὰ πλείους εἰσὶν· ἡ μὲν κοινὴ πᾶσιν, ἡ διαιροῦσι τὸ θῆλυ καὶ τὸ ἄρρεν, ὡν τὸ μὲν καρποφόρον τὸ δὲ ἄκαρπον ἐπὶ τινων. ἐν οἷς δὲ ἄμφω καρποφόρα τὸ θῆλυ καλλικαρπότερον καὶ πολυκαρπότερον· πλὴν ὅσοι ταῦτα καλοῦσιν ἄρρενα, καλοῦσι γάρ τινες. παραπλησία δὲ ἡ τοιαύτη διαφορὰ καὶ ὡς τὸ ἥμερον διήρηται πρὸς τὸ ἄγριον. ἐτέρα δὲ κατ’ εἶδος αὐτῶν τῶν ὄμοιγενῶν· ὑπὲρ ὡν λεκτέον ἄμα συνεμφαίνοντας καὶ τὰς ἴδιας μορφὰς τῶν μὴ φανερῶν καὶ γνωρίμων.

¹ Plin. 16. 31.

² Hes. *Op.* 233.

³ Plin. 16. 16.

⁴ λεκτέον add. Sch.

tains flies : but as it develops, it becomes hard, like a small smooth gall.

Such are the growths which the oak produces as well as its fruit. For as for the fungi¹ which grow from the roots or beside them, these occur also in other trees. So too with the oak-mistletoe ; for this grows on other trees also. However, apart from that, the oak, as was said, produces more things than any other tree ; and all the more so if, as Hesiod² says, it produces honey and even bees ; however, the truth appears to be that this honey-like juice comes from the air and settles on this more than on other trees. They say also that, when the oak is burnt, nitre is produced from it. Such are the things peculiar to the oak.

Of 'male' and 'female' in trees: the oak as an example of this and other differences.

VIII. ³ Taking, as was said, all trees according to their kinds, we find a number of differences. Common to them all is that by which men distinguish the 'male' and the 'female,' the latter being fruit-bearing, the former barren in some kinds. In those kinds in which both forms are fruit-bearing the 'female' has fairer and more abundant fruit ; however some call these the 'male' trees—for there are those who actually thus invert the names. This difference is of the same character as that which distinguishes the cultivated from the wild tree, while other differences distinguish different forms of the same kind ; and these we must discuss,⁴ at the same time indicating the peculiar forms, where these are not⁵ obvious and easy to recognise.

⁵ μὴ conj. St. ; μήτε Ald. H.

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2 Δρυὸς δὴ γένη—ταύτην γὰρ μᾶλιστα διαιροῦσι· καὶ ἔνιοι γε εὐθὺς τὴν μὲν ἡμερον καλοῦσι τὴν δ' ἀγρίαν οὐ τῇ γλυκύτητι τοῦ καρποῦ διαιροῦντες· ἐπεὶ γλυκύτατός γε ὁ τῆς φηγοῦ, ταύτην δ' ἀγρίαν ποιοῦσιν ἀλλὰ τῷ μᾶλλον ἐν τοῖς ἐργασίμοις φύεσθαι καὶ τὸ ξύλον ἔχειν λειότερον, τὴν δὲ φηγὸν τραχὺν καὶ ἐν τοῖς ὀρεινοῖς—γένη μὲν οὖν οἱ μὲν τέτταρα ποιοῦσιν οἱ δὲ πέντε. διαλλάττουσι δ' ἔνια τοῖς ὀνόμασιν, οἷον τὴν τὰς γλυκείας φέρουσαν οἱ μὲν ἡμερίδα καλοῦντες οἱ δ' ἐτυμόδρυν. ὁμοίως δὲ καὶ ἐπ' ἄλλων. ὡς δ' οὖν οἱ περὶ τὴν "Ιδην διαιροῦσι, τάδ' ἐστὶ τὰ εἴδη· ἡμερὶς αἰγίλωψ πλατύφυλλος φηγὸς ἀλίφλοιος· οἱ δὲ εὐθύφλοιον καλοῦσιν. κάρπιμα μὲν πάντα· γλυκύτατα δὲ τὰ τῆς φηγοῦ, καθάπερ εἴρηται, καὶ δεύτερον τὰ τῆς ἡμερίδος, ἐπειτα τῆς πλατυφύλλου, καὶ τέταρτον ἡ ἀλίφλοιος, ἔσχατον δὲ 3 καὶ πικρότατον ἡ αἰγίλωψ. οὐχ ἄπασαι δὲ γλυκεῖαι ἐν τοῖς γένεσιν ἀλλ' ἐνίστε καὶ πικραί, καθάπερ ἡ φηγός. διαφέρουσι δὲ καὶ τοῖς μεγέθεσι καὶ τοῖς σχήμασι καὶ τοῖς χρώμασι τῶν βαλάνων. Ἰδιον δὲ ἔχουσιν ἡ τε φηγὸς καὶ ἡ ἀλίφλοιος· ἀμφότεραι γὰρ παραλιθάζουσιν ἐν τοῖς ἄρρεσι καλουμένοις ἐξ ἄκρων τῶν βαλάνων ἐκατέρωθεν, αἱ μὲν πρὸς τῷ κελύφει αἱ δὲ πρὸς

¹ Plin. 16. 16 and 17.

² See Index, δρῦς and ἡμερίς. ἡμερίς, lit. 'cultivated oak.'

³ Plin. 16. 20.

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¹ Take then the various kinds of oak; for in this tree men recognise more differences than in any other. Some simply speak of a cultivated and a wild kind, not recognising any distinction made by the sweetness of the fruit; (for sweetest is that of the kind called Valonia oak, and this they make the wild kind), but distinguishing the cultivated kind by its growing more commonly on tilled land and having smoother timber, while the Valonia oak has rough wood and grows in mountain districts. Thus some make four kinds, others five. They also in some cases vary as to the names assigned; thus the kind which bears sweet fruit is called by some *hemeris*, by others 'true oak.' So too with other kinds. However, to take the classification given by the people of Mount Ida, these ² are the kinds: *hemeris* (gall-oak), *aigilops* (Turkey-oak), 'broad-leaved' oak (scrub oak), Valonia oak, sea-bark oak, which some call 'straight-barked' oak. ³ All these bear fruit; but the fruits of Valonia oak are the sweetest, as has been said; second to these those of *hemeris* (gall-oak), third those of the 'broad-leaved' oak (scrub oak), fourth sea-bark oak, and last *aigilops* (Turkey-oak), whose fruits are very bitter. ⁴ However the fruit is not always sweet in the kinds specified as such ⁵; sometimes it is bitter, that of the Valonia oak for instance. There are also differences in the size shape and colour of the acorns. Those of Valonia oak and sea-bark oak are peculiar; in both of these kinds on what are called the 'male' trees the acorns become stony at one end or the other; in one kind this hardening takes place in the end which is

⁴ Plin. 16. 19-21.

⁵ οὐχ . . . ἐποτε conj. W.; text defective in Ald. H.

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αὐτῇ τῇ σαρκί. δι' ὁ καὶ ἀφαιρεθέντων ὅμοια γίνεται κοιλώματα τοῖς ἐπὶ τῶν ζώων.

4 Διαφέρουσι δὲ καὶ τοῖς φύλλοις καὶ τοῖς στελέχεσι καὶ τοῖς ξύλοις καὶ τῇ ὅλῃ μορφῇ. ἡ μὲν γὰρ ἡμερὶς οὐκ ὄρθοφυῆς οὐδὲ λεία οὐδὲ μακρά· περίκομος γὰρ ἡ φυτεία καὶ ἐπεστραμμένη καὶ πολυμάσχαλος, ὥστε ὀξώδη καὶ βραχεῖαν γίνεσθαι· τὸ δὲ ξύλον ἴσχυρὸν μὲν ἀσθενέστερον δὲ τῆς φηγοῦ· τοῦτο γὰρ ἴσχυρότατον καὶ ἀσαπέστατον. οὐκ ὄρθοφυῆς δὲ οὐδὲ αὕτη ἀλλ' ἡττον ἔτι τῆς ἡμερίδος, τὸ δὲ στέλεχος παχύτατον, ὥστε καὶ τὴν ὅλην μορφὴν βραχεῖαν εἶναι· καὶ γὰρ ἡ φυτεία περίκομος καὶ ταυτη καὶ οὐκ εἰς ὄρθον. ἡ δὲ αὐγίλωψ ὄρθοφυέστατον καὶ ὑψηλότατον καὶ λειότατον καὶ τὸ ξύλον εἰς μῆκος ἴσχυρότατον. οὐ φύεται δὲ ἐν τοῖς ἔργασίμοις ἡ σπανίως.

5 Ἡ δὲ πλατύφυλλος δεύτερον ὄρθοφυῖα καὶ μῆκει, πρὸς δὲ τὴν χρείαν τὴν οἰκοδομικὴν χείριστον μετὰ τὴν ἀλίφλοιον, φαῦλον δὲ καὶ εἰς τὸ καίειν καὶ ἀνθρακεύειν, ὥσπερ καὶ τὸ τῆς ἀλιφλοίου, καὶ θριπηδέστατον μετ' ἐκείνην· ἡ γὰρ ἀλίφλοιος παχὺ μὲν ἔχει τὸ στέλεχος χαῦνον δὲ καὶ κοῖλον ἔαν ἔχῃ πάχος ὡς ἐπὶ τὸ πολύ, δι' ὁ καὶ ἀχρεῖον εἰς τὰς οἰκοδομάς· ἔτι δὲ σήπεται τάχιστα· καὶ γὰρ ἔνυγρόν ἔστι τὸ δένδρον· δι' ὁ καὶ κοῖλη γίνεται. φασὶ δέ τινες οὐδὲ ἐγκάρδιον εἶναι μόνη. λέγουσιν ὡς καὶ κεραυνοβλῆτες αὗται μόναι γίνονται καίπερ ὑψος οὐκ ἔχουσαι

¹ i.e. at the 'top' end; πρὸς: ? εν, πρὸς being repeated by mistake.

² ζώων MSS.; ὠῶν conj. Palm.

³ Plin. 16. 22.

ENQUIRY INTO PLANTS, III. viii. 3-5

attached to the cup, in the other in the flesh itself.¹ Wherefore, when the cups are taken off, we find a cavity like the visceral cavities in animals.²

³ There are also differences in leaves trunk timber and general appearance. *Hemeris* (gall-oak) is not straight-growing nor smooth nor tall, for its growth is very leafy⁴ and twisted, with many side-branches, so that it makes a low much-branched tree : its timber is strong, but not so strong as that of the Valonia oak, for that is the strongest and the least liable to rot. This⁵ kind too is not straight-growing, even less so than the *hemeris* (gall-oak), but the trunk is very thick, so that the whole appearance is stunted ; for in growth this kind too is very leafy⁴ and not erect. The *aigilops* (Turkey oak) is the straightest growing and also the tallest and smoothest, and its wood, cut lengthways, is the strongest. It does not grow on tilled land, or very rarely.

The 'broad-leaved' oak (scrub oak)⁶ comes second as to straightness of growth and length of timber to be got from it, but for use in building it is the worst next after the sea-bark oak, and it is even poor wood for burning and making charcoal, as is also that of the sea-bark oak, and next after this kind it is the most worm-eaten. For the sea-bark oak has a thick trunk, but it is generally spongy and hollow when it is thick ; wherefore it is useless for building. Moreover it rots very quickly, for the tree contains much moisture ; and that is why it also becomes hollow ; and some say that it is the only⁷ oak which has no heart. And some of the Aeolians say that these are the only oaks which are struck by light-

¹ i.e. of bushy habit.

⁶ αῦτη conj. Sch.; αὐτὴ U Ald.

² Plin. 16. 23 and 24.

⁷ μόνη conj. St.; μόνην Ald. H.

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τῶν Αἰολέων τινές, οὐδὲ πρὸς τὰ ἱερὰ χρῶνται τοῖς ξύλοις. κατὰ μὲν οὖν τὰ ξύλα καὶ τὰς ὅλας μορφὰς ἐν τούτοις αἱ διαφοραί.

6 Κηκίδας δὲ πάντα φέρει τὰ γένη, μόνη δὲ εἰς τὰ δέρματα χρησίμην ἡ ἡμερίς. ἡ δὲ τῆς αἰγίλωπος καὶ τῆς πλατυφύλλου τῇ μὲν ὅψει παρομία τῇ τῆς ἡμερίδος, πλὴν λειοτέρα, ἀχρεῖος δέ. φέρει καὶ τὴν ἑτέραν τὴν μέλαιναν ἡ τὰ ἔρια βάπτουσιν. ὃ δὲ καλοῦσί τινες φάσκον ὅμοιον τοῖς ῥακίοις ἡ αἰγίλωψ μόνη φέρει πολιὸν καὶ τραχύ· καὶ γὰρ πηχυαῖνον κατακρεμάννυται, καθάπερ τρύχος ὀθονίου μακρόν. φύεται δὲ τοῦτο ἐκ τοῦ φλοιοῦ καὶ οὐκ ἐκ τῆς κορύνης δθεν ἡ βάλανος, οὐδὲ ἐξ ὀφθαλμοῦ ἀλλ' ἐκ τοῦ πλαγίου τῶν ἄνωθεν ὅξων. ἡ δ' ἀλίφλοιος ἐπίμελαιν τοῦτο φύει καὶ βραχύ.

7 Οἱ μὲν οὖν ἐκ τῆς "Ιδης οὔτως διαιροῦσιν. οἱ δὲ περὶ Μακεδονίαν τέτταρα γένη ποιοῦσιν, ἐτυμόδρυν ἡ τὰς γλυκείας, πλατύφυλλον ἡ τὰς πικράς, φηγὸν ἡ τὰς στρογγύλας, ἄσπριν· ταύτην δὲ οἱ μὲν ἄκαρπον ὅλως οἱ δὲ φαῦλον τὸν καρπόν, ὥστε μηδὲν ἐσθίειν ζῶν πλὴν ὑός, καὶ ταύτην ὅταν ἑτέραν μὴ ἔχῃ· καὶ τὰ πολλὰ λαμβάνεσθαι περικεφαλαίᾳ. μοχθηρὰ δὲ καὶ τὰ ξύλα· πελε-

¹ Plin. 16. 26.

² φάσκον . . . ῥακίοις conj. Sch. (ῥακίοις Salm.): φάσκος ὅμοιος τοῖς βραχείοις UP₂; φάσκον ὅμοιως τοῖς βραγχίοις Ald. H. Plin. 16. 33, cf. 12. 108; Diosc. 1. 20; Hesych. s.v. φάσκος.

³ τραχὺ conj. W.; βραχὺ UP. ⁴ κορύνης. cf. 3. 5. 1.

ning, although they are not lofty; nor do they use the wood for their sacrifices. Such then are the differences as to timber and general appearance.

¹ All the kinds produce galls, but only *hemeris* (gall-oak) produces one which is of use for tanning hides. That of *aigilops* (Turkey-oak) and that of the 'broad-leaved' oak (scrub oak) are in appearance like that of *hemeris* (gall-oak), but smoother and useless. This also produces the other gall, the black kind, with which they dye wool. The substance which some call tree-moss and which resembles rags² is borne only by the *aigilops* (Turkey-oak); it is grey and rough³ and hangs down for a cubit's length, like a long shred of linen. This grows from the bark and not from the knob⁴ whence the acorn starts; nor does it grow from an eye, but from the side of the upper boughs. The sea-bark oak also produces this, but it is blackish⁵ and short.

Thus the people of Mount Ida distinguish. But the people of Macedonia make four kinds, 'true-oak,' or the oak which bears the sweet acorns, 'broad-leaved' oak (scrub oak), or that which bears the bitter ones, Valonia oak, or that which bears the round ones, and *aspris*⁶ (Turkey-oak);⁷ the last-named some say is altogether without fruit, some say it bears poor fruit, so that no animal eats it except the pig, and only he when he can get no others, and that after eating it the pig mostly gets an affection of the head.⁸ The wood is also wretched; when hewn with the axe it is altogether

⁵ ἐπίμελαν τοῦτο φύει conj. Scal.; ἐπιμ. τοῦτο φύσει U; ἐπιμελίαν τοῦτο φύει MVAld.

⁶ See Index.

⁷ Plin. 16. 24.

⁸ περικεφαλαίᾳ: apparently the name of a disease.

κηθέντα μὲν ὅλως ἀχρεῖα· καταρήγνυται γὰρ καὶ διαπίπτει· ἀπελέκητα δὲ βελτίω, δι' ὃ καὶ οὕτω χρῶνται. μοχθηρὰ δὲ καὶ εἰς καῦσιν καὶ εἰς ἀνθρακείαν· ἀχρεῖος γὰρ ὅλως ὁ ἀνθραξ διὰ τὸ πηδᾶν καὶ σπινθηρίζειν πλὴν τοῖς χαλκεῦσι. τούτοις δὲ χρησιμώτερος τῶν ἄλλων· διὰ γὰρ τὸ ἀποσβέννυσθαι, ὅταν παύσηται φυσώμενος, ὀλίγος ἀναλίσκεται. [τὸ δὲ τῆς ἀλιφλοίου χρήσιμον εἰς τοὺς ἄξονας μόνον καὶ τὰ τοιαῦτα.] δρυὸς μὲν οὖν ταύτας ποιοῦσι τὰς ἴδεας.

IX. Τῶν δὲ ἄλλων ἐλάττους· καὶ σχεδὸν τά γε πλεῖστα διαιροῦσι ἄρρενι καὶ θήλει, καθάπερ εἱρηται, πλὴν ὀλίγων ὧν ἔστι καὶ ἡ πεύκη· πεύκης γὰρ τὸ μὲν ἥμερον ποιοῦσι τὸ δ' ἄγριον, τῆς δ' ἄγριας δύο γένη· καλοῦσι δὲ τὴν μὲν Ἰδαίαν τὴν δὲ παραλίαν· τούτων δὲ ὄρθοτέρα καὶ μακρότερα καὶ τὸ φύλλον ἔχουσα παχύτερον ἡ Ἰδαία, τὸ δὲ φύλλον λεπτότερον καὶ ἀμενηνότερον ἡ παραλία καὶ λειότερον τὸν φλοιὸν καὶ εἰς τὰ δέρματα χρήσιμον· ἡ δὲ ἔτέρα οὕ. καὶ τῶν στροβίλων ὁ μὲν τῆς παραλίας στρογγύλος τε καὶ διαχάσκων ταχέως, ὁ δὲ τῆς Ἰδαίας μακρότερος καὶ χλωρὸς καὶ ἡττον χάσκων ὡς ἀν ἄγριώτερος· τὸ δὲ ἔνδιον ἵσχυρότερον τὸ τῆς παραλίας· δεῖ γὰρ καὶ τὰς τοιαύτας διαφορὰς

¹ Plin. 16. 23.

² τὸ δὲ . . . τοιαῦτα: this sentence seems out of place, as ἀλιφλοίος was not one of the 'Macedonian' oaks mentioned above (Sch.).

useless, for it breaks in pieces and falls asunder; if it is not hewn with the axe it is better, wherefore they so use it. ¹ It is even wretched for burning and for making charcoal; for the charcoal is entirely useless except to the smith, because it springs about and emits sparks. But for use in the smithy it is more serviceable than the other kinds, since, as it goes out when it ceases to be blown, little of it is consumed. ² The wood of the sea-bark oak is only useful for wheel-axles and the like purposes. Such are the varieties of the oak³ which men make out.

Of the differences in firs.

IX. ⁴The differences between other trees are fewer; for the most part men distinguish them merely according as they are 'male' or 'female,' as has been said, except in a few cases including the fir; for in this tree they distinguish the wild and the cultivated⁵ kinds, and make two wild kinds, calling one the 'fir of Ida' (Corsican pine⁶) the other the 'fir of the sea-shore' (Aleppo pine); of these the former is straighter and taller and has thicker leaves,⁷ while in the latter the leaves are slenderer and weaker, and the bark is smoother and useful for tanning hides, which the other is not. Moreover the cone of the seaside kind is round and soon splits open, while that of the Idaean kind is longer and green and does not open so much, as being of wilder character. The timber of the seaside kind is stronger,—for one must note such differences also between trees of the

³ T. describes πρῖνος σμῖλαξ, and φελλόδρυς in 3. 16, φελλός in 3. 17. 1.

⁴ Plin. 16. 43.

⁵ Stone pine. See Index.

⁶ Plin. 16. 48.

⁷ φύλλον W. conj.; ξύλον UMVP.

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λαμβάνειν τῶν συγγενῶν· γνώριμοι γὰρ διὰ τὴν χρείαν.

2 Ὁρθότερον δὲ καὶ παχύτερον, ὥσπερ εἴπομεν, ἡ Ἰδαία, καὶ πρὸς τούτοις πιττωδέστερον ὅλως τὸ δένδρον, μελαντέρᾳ δὲ πίττῃ καὶ γλυκυτέρᾳ καὶ λεπτότέρᾳ καὶ εὐωδεστέρᾳ, ὅταν ἡ ὡμή· ἐψηθεῖσα δὲ χείρων ἐκβαίνει διὰ τὸ πολὺν ἔχειν τὸν ὄρρον. ἐοίκασι δ' ἄπερ οὗτοι διαιροῦσιν ὄνόμασιν ἴδιοις οἱ ἄλλοι διαιρεῦν τῷ ἄρρενι καὶ θῆλει. φασὶ δ' οἱ περὶ Μακεδονίαν καὶ ἄκαρπόν τι γένος δλῶς εἶναι πεύκης, καὶ τὸ μὲν ἄρρεν βραχύτερόν τε καὶ σκληροφυλλότερον, τὸ δὲ θῆλυ εὐμηκέστερον, καὶ τὰ φύλλα λιπαρὰ καὶ ἀπαλὰ καὶ κεκλιμένα μᾶλλον ἔχειν· ἔτι δὲ τὰ ἔντα τῆς μὲν ἄρρενος περίμητρα καὶ σκληρὰ καὶ ἐν ταῖς ἔργασίαις στρεφόμενα, τῆς δὲ θηλείας εὐεργὰ καὶ ἀστραβῆ καὶ μαλακώτερα.

3 Σχεδὸν δὲ κοινή τις ἡ διαφορὰ πάντων τῶν ἄρρενων καὶ θηλειῶν, ὡς οἱ ὑλοτόμοι φασίν. ἄπαν γὰρ τὸ ἄρρεν τῇ πελεκήσει καὶ βραχύτερον καὶ ἐπεστραμμένον μᾶλλον καὶ δυσεργότερον καὶ τῷ χρώματι μελάντερον, τὸ δὲ θῆλυ εὐμηκέστερον· ἐπεὶ καὶ τὴν αἰγίδα τὴν καλουμένην ἡ θήλεια τῆς πεύκης ἔχει· τοῦτο δ' ἐστὶ τὸ ἐγκάρδιον αὐτῆς.

¹ συγγενῶν conj. R. Const.; ἀγγείων U Ald.; ἐγγείων MV m Bas.

² γνώριμοι conj. R. Const.; γνώριμος U Ald. H.; γνώριμα conj. W.

³ ὄρθότερον conj. R. Const.; ὀξύτερον UMVAld.

⁴ μελαντέρᾳ . . . εὐωδεστέρᾳ conj. W.; μελάντεραι δὲ πίττῃ καὶ γλυκύτεραι καὶ λεπτότεραι καὶ εὐωδέστεραι UMV; μελαντέρᾳ

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same kind,¹ since it is by their use that the different characters are recognised.²

The Idaean kind is, as we have said, of straighter³ and stouter growth, and moreover the tree is altogether more full of pitch, and its pitch is blacker sweeter thinner and more fragrant⁴ when it is fresh; though, when it is boiled, it turns out inferior,⁵ because it contains so much watery matter. However it appears that the kinds which these people distinguish by special names are distinguished by others merely as 'male' and 'female.' The people of Macedonia say that there is also a kind of fir which bears no fruit whatever, in which the 'male'⁶ (Aleppo pine) is shorter and has harder leaves, while the 'female' (Corsican pine) is taller and has glistening delicate leaves which are more pendent. Moreover the timber of the 'male' kind has much heart-wood,⁷ is tough, and warps in joinery work, while that of the 'female' is easy to work, does not warp,⁸ and is softer.

This distinction between 'male' and 'female' may, according to the woodmen, be said to be common to all trees. Any wood of a 'male' tree, when one comes to cut it with the axe, gives shorter lengths, is more twisted, harder to work, and darker in colour; while the 'female' gives better lengths. For it is the 'female' fir which contains what is called the *aegis*⁹; this is the heart of the tree; the

δὲ καὶ γλυκυτέρα καὶ λεπτοτέρα καὶ εὐωδεστέρα Ald. λεπτοτέρα, ? less viscous.

⁵ cf. 9. 2. 5; Plin. 16. 60. ⁶ Plin. 16. 47.

⁷ περιμητρα conj. R. Const.: so Mold. explains; περιμήτρια UMV. cf. 3. 9. 6.

⁸ ἀστραβῆ conj. R. Const.; εὐστραβῆ Ald.

⁹ αἰγίδα: cf. 5. 1. 9; Plin. 16. 187.

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αἴτιον δὲ ὅτι ἀπευκοτέρα καὶ ἡπτον ἔνδαδος καὶ λειοτέρα καὶ εὐκτεανωτέρα. γίνεται δὲ ἐν τοῖς μέγεθος ἔχουσι τῶν δένδρων, ὅταν ἐκπεσόντα περισταῇ τὰ λευκὰ τὰ κύκλῳ. τούτων γὰρ περιαιρεθέντων καὶ καταλειφθείσης τῆς μήτρας ἐκ ταύτης πελεκάται· ἔστι δὲ εὐχρούν σφόδρα καὶ λεπτόινον. ὃ δὲ οἱ περὶ τὴν Ἰδην δαδουργοὶ καλοῦσι συκῆν, τὸ ἐπιγιγνόμενον ἐν ταῖς πεύκαις, ἐρυθρότερον τὴν χροιὰν τῆς δαδός, ἐν τοῖς ἄρρεσίν ἔστι μᾶλλον· δυσώδες δὲ τοῦτο καὶ οὐκ ὅζει δαδός οὐδὲ καίεται ἀλλ' ἀποπηδᾷ ἀπὸ τοῦ πυρός.

4 Πεύκης μὲν οὖν ταῦτα γένη ποιοῦσιν, ἥμερόν τε καὶ ἄγριον, καὶ τῆς ἀγρίας ἄρρενά τε καὶ θῆλειαν καὶ τρίτην τὴν ἄκαρπον. οἱ δὲ περὶ τὴν Ἀρκαδίαν οὔτε τὴν ἄκαρπον λέγουσιν οὔτε τὴν ἥμερον πεύκην, ἀλλὰ πίτυν εἶναι φασι· καὶ γὰρ τὸ στέλεχος ἐμφερέστατον εἶναι τῇ πίτυῃ καὶ ἔχειν τὴν τε λεπτότητα καὶ τὸ μέγεθος καὶ ἐν ταῖς ἐργασίαις ταύτῳ τὸ ξύλον· τὸ γὰρ τῆς πεύκης καὶ παχύτερον καὶ λειότερον καὶ ὑψηλότερον εἶναι· καὶ τὰ φύλλα τὴν μὲν πεύκην ἔχειν πολλὰ καὶ λιπαρὰ καὶ βαθέα καὶ κεκλιμένα, τὴν δὲ πίτυν καὶ τὴν κωνοφόρον ταύτην ὀλίγα τε καὶ αὐχμωδέστερα καὶ πεφρικότα μᾶλλον. <ἄμφω δὲ τριχόφυλλα.> ἔτι δὲ τὴν πίτταν ἐμφερεστέραν τῆς

¹ εὐκτεανωτέρα : εὐκτηδονωτέρα conj. R. Const. cf. 5. 1. 9 : but text is supported by Hesych. s.v. ἰθυκτέανον.

² I omit καὶ before τὰ κύκλῳ.

³ Plin. 16. 44.

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reason being that it is less resinous, less soaked with pitch, smoother, and of straighter grain.¹ This *aigis* is found in the larger trees, when, as they have fallen down, the white outside part² has decayed; when this has been stripped off and the core left, it is cut out of this with the axe; and it is of a good colour with fine fibre. However the substance which the torch-cutters of Mount Ida call the 'fig,'³ which forms in the fir and is redder in colour than the resin, is found more in the 'male' trees; it has an evil smell, not like the smell of resin, nor will it burn, but it leaps away from the fire.

⁴ Such are the kinds of fir which they make out, the cultivated and the wild, the latter including the 'male' and the 'female' and also the kind which bears no fruit. However the Arcadians say that neither the sterile kind nor the cultivated is a fir, but a pine; for, they say, the trunk closely resembles the pine and has its slenderness, its stature, and the same kind⁵ of wood for purposes of joinery, the trunk of the fir being thicker smoother and taller; moreover that the fir has many leaves, which are glossy massed together⁶ and pendent, while in the pine and in the above-mentioned cone-bearing tree⁷ the leaves are few and drier and stiffer; though in both the leaves are hair-like.⁸ Also, they say, the pitch of this tree is more like that of the pine; for

⁴ ταῦτα γένη conj. R. Const. from G; ταῦτα γε UMVAld.; Plin. 16. 45-49.

⁵ ταῦτα conj. W.; αὐτὰ Ald.

⁶ Βαθία: δασέα conj. R. Const. cf. 3. 16. 2.

⁷ i.e. the cultivated πεύκη (so called). T. uses this periphrasis to avoid begging the question of the name.

⁸ ἄμφω δὲ τριχ. ins. here by Sch.; in MSS. and Ald. the words occur in § 5 after πιπερίστερον.

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πίτυος· καὶ γὰρ τὴν πίτυν ἔχειν ὀλίγην τε καὶ πικράν, ὥσπερ καὶ τὴν κωνοφόρουν, τὴν δὲ πεύκην εὐώδη καὶ πολλήν. φύεται δὲ ἐν μὲν τῇ Ἀρκαδίᾳ ἡ πίτυς ὀλίγη περὶ δὲ τὴν Ἡλείαν πολλή. οὗτοι μὲν οὖν ὅλων τῷ γένει διαμφισβητοῦσιν.

5 'Η δὲ πίτυς δοκεῖ τῆς πεύκης καὶ διαφέρειν τῷ λιπαρωτέρα τε εἶναι καὶ λεπτοφυλλοτέρα καὶ τὸ μέγεθος ἐλάττων καὶ ἡττον ὀρθοφυής· ἔτι δὲ τὸν κῶνον ἐλάττω φέρειν καὶ πεφρικότα μᾶλλον καὶ τὸ κάρυον πιττωδέστερον· καὶ τὰ ξύλα λευκότερα καὶ ομοιότερα τῇ ἐλάτῃ καὶ τὸ ὄλον ἄπευκα. διαφορὰν δὲ ἔχει καὶ ταύτην μεγάλην πρὸς τὴν πεύκην· πεύκην μὲν γὰρ ἐπικαυθεισῶν τῶν ρίζῶν οὐκ ἀναβλαστάνειν, τὴν πίτυν δέ φασί τινες ἀναβλαστάνειν, ὥσπερ καὶ ἐν Λέσβῳ ἐμπρησθέντος τοῦ Πυρραιών ὄρους τοῦ πιτυώδους. νόσημα δὲ ταῖς πεύκαις τοιοῦτον τι λέγουσι συμβαίνειν οἱ περὶ τὴν Ἰδην ὥστ', ὅταν μὴ μόνον τὸ ἐγκάρδιον ἀλλὰ καὶ τὸ ἔξω τοῦ στελέχους ἔνδαδον γένηται, τηνικαῦτα ὥσπερ ἀποπνίγεσθαι. τοῦτο δὲ αὐτόματον συμβαίνει δι' εὐτροφίαν τοῦ δένδρου, ὡς ἂν τις εἰκάσειεν· ὅλον γὰρ γίνεται δάσ· περὶ μὲν οὖν τὴν πεύκην ἴδιον τοῦτο πάθος.

6 'Ἐλάτῃ δὲ ἔστιν ἡ μὲν ἄρρητην ἡ δὲ θήλεια, διαφορὰς δὲ ἔχουσα τοῖς φύλλοις· ὀξύτερα γὰρ καὶ κεντητικώτερα τὰ τοῦ ἄρρενος καὶ ἐπεστραμμένα μᾶλλον, δι' ὃ καὶ οὐλότερον τῇ ὅψει φαίνεται τὸ δένδρον ὅλον. καὶ τῷ ξύλῳ· λευκότερον γὰρ καὶ μαλακώτερον καὶ εὐεργέστερον τὸ τῆς θήλειας καὶ

¹ πικρὰν conj. R. Const. from G; μικρὰν V Ald.

² καὶ ταύτην μεγάλην πρὸς conj. Sch.; καὶ τὴν μεγ. πρὸς UMV; μεγάλην πρὸς Ald.

ENQUIRY INTO PLANTS, III. ix. 4-6

in the pine too it is scanty and bitter,¹ as in this other cone-bearing tree, but in the fir it is fragrant and abundant. Now the pine is rare in Arcadia, but common in Elis. The Arcadians then dispute altogether the nomenclature.

The pine appears to differ also from the fir in being glossier and having finer leaves, while it is smaller in stature and does not grow so straight; also in bearing a smaller cone, which is stiffer and has a more pitchy kernel, while its wood is whiter, more like that of the silver-fir, and wholly free from pitch. And there is another great difference² between it and the fir; the fir, if it is burnt down to the roots, does not shoot up again, while the pine, according to some, will do so; for instance this happened in Lesbos,³ when the pine-forest of Pyrrha⁴ was burnt. The people of Ida say that the fir is liable to a kind of disease;—when not only the heart but the outer part of the trunk becomes glutted⁵ with pitch, the tree then is as it were choked. This happens of its own accord through the excessive luxuriance of the tree, as one may conjecture; for it all turns into pitch-glutted wood. This then is an affection peculiar to the fir.

⁶ The silver-fir is either 'male' or 'female,' and has differences in its leaves⁷; those of the 'male' are sharper more needle-like and more bent; wherefore the whole tree has a more compact appearance. There are also differences in the wood, that of the 'female' being whiter softer and easier to work,

¹ *εν Λέσβῳ* conj. W. from G, and Plin. 16. 46; *εἰς Λέσβον* MSS.

² On the W. of Lesbos, modern Caloni. *cf.* 2. 2. 6; Plin. *l.c.*

³ *cf.* 1. 6. 1; Plin. 16. 44.

⁴ Plin. 16. 48. ⁷ *cf.* 1. 8. 2.

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τὸ δὲ στέλεχος εὐμηκέστερον· τὸ δὲ τοῦ ἄρρενος ποικιλώτερον καὶ παχύτερον καὶ σκληρότερον καὶ περίμητρον μᾶλλον ὅλως δὲ φαυλότερον τὴν ὅψιν. ἐν δὲ τῷ κώνῳ τῷ μὲν τοῦ ἄρρενός ἐστι κάρυνα ὀλίγα ἐπὶ τοῦ ἄκρου, τῷ δὲ τῆς θηλείας ὅλως οὐδέν, ὡς οἱ ἐκ Μακεδονίας ἔλεγον. ἔχει δὲ πτέρυγας τὸ φύλλον καὶ ἐπ' ἔλαττον, ὥστε τὴν ὅλην μορφὴν εἶναι θολοειδῆ καὶ παρόμοιον μάλιστα ταῖς Βοιωτίαις κυνέαις· πυκνὸν δὲ οὕτως ὥστε μήτε χιόνα διεέναι μήθ' ὑετόν. ὅλως δὲ καὶ τῇ ὅψει τὸ δένδρον καλόν· καὶ γὰρ ἡ βλάστησις ἴδια τις, ὥσπερ εἴρηται, παρὰ τὰς ἄλλας καὶ μόνη τάξιν ἔχουσα· τῷ δὲ μεγέθει μέγα καὶ πολὺ τῆς πεύκης εὐμηκέστερον.

7 Διαφέρει δὲ καὶ κατὰ τὸ ξύλον οὐ μικρόν· τὸ μὲν γὰρ τῆς ἐλάτης ἴνωδες καὶ μαλακὸν καὶ κούφον, τὸ δὲ τῆς πεύκης δαδώδες καὶ βαρὺ καὶ σαρκωδέστερον. ὅζους δὲ ἔχει πλείους μὲν ἡ πεύκη σκληροτέρους δ' ἡ ἐλάτη, σχεδὸν δὲ πάντων ὡς εἰπεῖν σκληροτέρους, τὸ δὲ ξύλον μαλακώτερον. ὅλως δὲ οἱ ὅζοι πυκνότατοι καὶ στερεώτατοι μόνον οὐ διαφανεῖς ἐλάτης καὶ πεύκης καὶ τῷ χρώματι δαδώδεις καὶ μάλιστα διάφοροι τοῦ ξύλου, μᾶλλον δὲ τῆς ἐλάτης. ἔχει δέ, ὥσπερ ἡ πεύκη τὴν αἰγίδα, καὶ ἡ ἐλάτη τὸ λευκὸν λούσσον

¹ παχύτερον conj. W.; πλατύτερον Ald.

² Plin. 16. 48 and 49. ³ For the tense see Intr. p. xx.

⁴ φύλλον, i.e. the leafy shoot. Sch. considers φύλλον to be corrupt, and refers the following description to the cone; W. marks a lacuna after φύλλον. Pliny, l.c., seems to have read φύλλον, but does not render καὶ ἐπ' ἔλαττον . . . κυνέαις. The words καὶ ἐπ' ἔλαττον can hardly be sound as they stand. For the description of the foliage cf. 1. 10. 5.

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while the whole trunk is longer; that of the 'male' is less of a uniform colour thicker¹ and harder, has more heart-wood, and is altogether inferior in appearance. In the cone² of the 'male' are a few seeds at the apex, while that of the 'female,' according to what the Macedonians said,³ contains none at all. The foliage⁴ is feathered and the height disproportionate so that the general appearance of the tree is dome-like,⁵ and closely resembles the Boeotian peasant's hat⁶; and it is so dense that neither snow nor rain penetrates it. And in general the tree has a handsome appearance; for its growth is somewhat peculiar, as has been said, compared with the others, it being the only one which is regular, and in stature it is large, much taller than the fir.

⁷ There is also not a little difference in the wood: that of the silver-fir is fibrous⁸ soft and light, that of the fir is resinous heavy and more fleshy. The fir has more knots,⁹ but the silver-fir harder ones; indeed they may be said to be harder than those of any tree, though the wood otherwise is softer. And in general the knots of silver-fir and fir are of the closest and most solid¹⁰ texture and almost¹¹ transparent: in colour they are like resin-glutted wood, and quite different from the rest of the wood; and this is especially so¹² in the silver-fir. And just as the fir has its *aegis*,¹³ so the silver-fir has what is

⁵ θολοειδῆ conj. Scal.; θηλοειδῆ U (erased); θηλοειδὲς MV; *ut concameratum imitetur* G; ? θολοειδῆ; in Theocr. 15. 39. θολία seems to be a sun-hat.

⁶ κυνέας: cf. Hesych. s.v. κυνῆ Βοιωτία, apparently a hat worn in the fields.

⁷ cf. 5. 1. 7. ⁸ cf. 5. 1. 5. ⁹ cf. 5. 1. 6.

¹⁰ cf. 5. 1. 6, κερατώδεις. ¹¹ οὐ ins. Sch.

¹² μᾶλλον δὲ conj. W.; μᾶλλον η Ald. ¹³ cf. 3. 9. 3.

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καλούμενον, οἷον ἀντίστροφον τῇ αἰγίδι, πλὴν τὸ μὲν λευκὸν ἡ δὲ αἰγὶς εὔχρως διὰ τὸ ἔνδαδον. πυκνὸν δὲ καὶ λευκὸν γίνεται καὶ καλὸν ἐκ τῶν πρεσβυτέρων ἥδη δένδρων· ἀλλὰ σπάνιον τὸ χρηστόν, τὸ δὲ τυχὸν δαψιλές, ἐξ οὐ τά τε τῶν ζωγράφων πινάκια ποιοῦσι καὶ τὰ γραμματεῖα τὰ πολλά· τὰ δὲ ἐσπουδασμένα ἐκ τοῦ βελτίουνος.

8 Οἱ δὲ περὶ Ἀρκαδίαν ἀμφότερα καλοῦσιν αἰγίδα καὶ τὴν τῆς πεύκης καὶ τὴν τῆς ἐλάτης, καὶ εἰναι πλείω τὴν τῆς ἐλάτης ἀλλὰ καλλίω τὴν τῆς πεύκης· εἰναι γὰρ τῆς μὲν ἐλάτης πολλήν τε καὶ λείαν καὶ πυκνήν, τῆς δὲ πεύκης ὀλίγην, τὴν μέντοι οὖσαν οὐλοτέραν καὶ ἴσχυροτέραν καὶ τὸ ὅλον καλλίω. οὗτοι μὲν οὖν ἐοίκασι τοῖς ὄνόμασι διαφωνεῖν. ἡ δὲ ἐλάτη ταύτας ἔχει τὰς διαφορὰς πρὸς τὴν πεύκην καὶ ἔτι τὴν περὶ τὴν ἀμφαυξῖν, ἦν πρότερον εἴπομεν.

Χ. Ὁξύη δὲ οὐκ ἔχει διαφορὰς ἀλλ᾽ ἐστὶ μονογενές· ὄρθιοφυὲς δὲ καὶ λεῖον καὶ ἄνοξον καὶ πάχος καὶ ὑψος ἔχον σχεδὸν ἵσον τῇ ἐλάτῃ· καὶ τὰλλα δὲ παρόμοιον [τε] τὸ δένδρον· ξύλον δὲ εὔχρουν ἴσχυρὸν εὔινον καὶ φλοιὸν λεῖον καὶ παχύν, φύλλον δὲ ἀσχιδὲς προμηκέστερον ἀπίου καὶ ἐπακάνθιζον ἐξ ἄκρου, ρίζας οὔτε πολλὰς οὔτε κατὰ βάθους· ὁ δὲ καρπὸς λεῖος βαλανώδης ἐν ἔχίνῳ

¹ cf. Eur. *I.A.* 99; Hipp. 1254.

² τὰ δὲ conj. Scal.; καὶ Ald.

³ πεύκης conj. Scal. from G; ἐλάτης Ald.

⁴ ἐλάτης conj. Scal. from G; πεύκης Ald.

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called its white 'centre,' which answers, as it were, to the *aigis* of the fir, except that it is white, while the other is bright-coloured because it is glutted with pitch. It becomes close white and good in trees which are of some age, but it is seldom found in good condition, while the ordinary form of it is abundant and is used to make painters' boards and ordinary writing tablets,¹ superior ones being² made of the better form.

However the Arcadians call both substances *aigis*, alike that of the fir³ and the corresponding part of the silver-fir,⁴ and say that, though the silver-fir produces more, that of the fir is better; for that, though that of the silver-fir is abundant⁵ smooth and close, that of the fir, though scanty, is compacter stronger and fairer in general. The Arcadians then appear to differ as to the names which they give. Such are the differences in the silver-fir as compared with the fir, and there is also that of having the *amphaxis*,⁶ which we mentioned before.

Of beech, yew, hop-hornbeam, lime.

X. The beech presents no differences, there being but one kind. It is a straight-growing smooth and unbranched tree, and in thickness and height is about equal to the silver-fir, which it also resembles in other respects; the wood is of a fair colour strong and of good grain, the bark smooth and thick, the leaf undivided, longer than a pear-leaf, spinous at the tip,⁷ the roots neither numerous nor running deep; the fruit is smooth like an acorn, enclosed in a shell,

⁵ πολλὴν conj. Gesner; οὐλὴν UmBas.; δλην MVAld.

⁶ cf. 3. 7. 1.

⁷ i.e. mucronate. cf. 3. 11. 3.

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πλὴν [οὐκ] ἀνακάνθῳ καὶ λείῳ, καὶ οὐχ ὡς ἡ διοσβάλανος ἀκανθώδει, προσεμφερῆς δὲ καὶ κατὰ γλυκύτητα καὶ κατὰ τὸν χυλὸν ἔκείνῳ. γίνεται δὲ καὶ ἐν τῷ ὅρει λευκή, ἡ καὶ χρήσιμον ἔχει τὸ ξύλον πρὸς πολλά· καὶ γὰρ πρὸς ἀμαξουργίαν καὶ πρὸς κλινοπηγίαν καὶ εἰς διφρουργίαν καὶ εἰς τραπεζίαν καὶ εἰς ναυπηγίαν· ἡ δὲ ἐν τοῖς πεδίοις μέλαινα καὶ ἄχροντος πρὸς ταῦτα· τὸν δὲ καρπὸν ἔχουσι παραπλήσιον.

2 Μονογενῆς δὲ καὶ ἡ μίλος, ὄρθοφυῆς δὲ καὶ εὐαυξής καὶ ὁμοία τῇ ἐλάτῃ, πλὴν οὐχ ὑψηλὸν οὔτω, πολυμάσχαλον δὲ μᾶλλον. ὅμοιον δὲ καὶ τὸ φύλλον ἔχει τῇ ἐλάτῃ, λιπαρώτερον δὲ καὶ μαλακώτερον. τὸ δὲ ξύλον ἡ μὲν ἔξ 'Αρκαδίας μέλαινα καὶ φοινικοῦν, ἡ δὲ ἐκ τῆς Ἰδης ξανθὸν σφόδρα καὶ ὅμοιον τῇ κέδρῳ, δι' ὃ καὶ τοὺς πωλοῦντάς φασιν ἔξαπατάν ως κέδρον πωλοῦντας· πᾶν γὰρ εἶναι καρδίαν, ὅταν ὁ φλοιὸς περιαιρεθῇ· ὅμοιον δὲ καὶ τὸν φλοιὸν ἔχειν καὶ τῇ τραχύτητι καὶ τῷ χρώματι τῇ κέδρῳ, ρίζας δὲ μικρὰς καὶ λεπτὰς καὶ ἐπιπολαίους. σπάνιον δὲ τὸ δένδρον περὶ τὴν Ἰδην, περὶ δὲ Μακεδονίαν καὶ Ἀρκαδίαν πολύ· καὶ καρπὸν φέρει στρογγύλον μικρῷ μείζω κυάμου, τῷ χρώματι δὲ ἐρυθρὸν καὶ μαλακόν· φασὶ δὲ τὰ μὲν λόφουρα ἐὰν φάγη τῶν φύλλων ἀποθνήσκειν, τὰ δὲ μηρυκάζοντα οὐδὲν πάσχειν. τὸν δὲ καρπὸν ἔσθίουσι καὶ τῶν ἀνθρώπων τινὲς καὶ ἔστιν ἡδὺς καὶ ἀσινής.

¹ ἔχῖνος being otherwise used of a prickly case, such as that of the chestnut. πλὴν ἀνακ. καὶ λείῳ conj. W.; πλὴν οὐκ ἀνακάνθῳ καὶ λείῳ U; πλὴν οὐκ ἐν ἀκάνθῳ MVAld.

ENQUIRY INTO PLANTS, III. x. 1-2

which is however without prickles¹ and smooth, not spinous,² like the chestnut, though in sweetness and flavour it resembles it. In mountain country it also grows white and has³ timber which is useful for many purposes, for making carts beds chairs and tables, and for shipbuilding⁴; while the tree of the plains is black and useless for these purposes; but the fruit is much the same in both.

⁵ The yew has also but one kind, is straight-growing, grows readily, and is like the silver-fir, except that it is not so tall and is more branched. Its leaf is also like that of the silver-fir, but glossier and less stiff. As to the wood, in the Arcadian yew it is black or red, in that of Ida bright yellow and like prickly cedar; wherefore they say that dealers practise deceit, selling it for that wood: for that it is all heart, when the bark is stripped off; its bark also resembles that of prickly cedar in roughness and colour, its roots are few slender and shallow. The tree is rare about Ida, but common in Macedonia and Arcadia; it bears a round fruit a little larger than a bean, which is red in colour and soft; and they say that, if beasts of burden⁶ eat of the leaves they die, while ruminants take no hurt. Even men sometimes eat the fruit, which is sweet and harmless.

² ἀκανθώδει: conj. R. Const.; ἀκανθώδη Ald. H.

³ λευκή ή καλ εονj. W.; λευκή τε καλ Ald. H.

⁴ cf. 5. 6. 4; 5. 7. 2 and 6.

⁵ Plin. 16. 62. (description taken from this passage, but applied to *fraxinus*, apparently from confusion between *μίλος* and *μελία*).

⁶ cf. 2. 7. 4 n.

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3 "Εστι δὲ καὶ ἡ ὄστρυνος μονοειδής, ἣν καλοῦσί τινες ὄστρυάν, ὁμοφυὲς τῇ ὄξυᾳ τῇ τε φυτείᾳ καὶ τῷ φλοιῷ· φύλλα δὲ ἀπιοειδῆ τῷ σχήματι, πλὴν προμηκέστερα πολλῷ καὶ εἰς ὄξὺ συνηγμένα καὶ μείζω, πολύϊνα δέ, ἀπὸ τῆς μέσης εὐθείας καὶ μεγάλης τῶν ἄλλων πλευροειδῶς κατατεινουσῶν καὶ πάχος ἔχουσῶν· ἔτι δὲ ἐρρυτιδωμένα κατὰ τὰς ἵνας καὶ χαραγμὸν ἔχοντα κύκλῳ λεπτόν· τὸ δὲ ἔξιλον σκληρὸν καὶ ἄχρονν, ἔκλευκον· καρπὸν δὲ μικρὸν πρόμακρον ὅμοιον κριθῆ ἔανθόν· ρίζας δὲ ἔχει μετεώρους· ἔνυδρον δὲ καὶ φαραγγῶδες. λέγεται δὲ ὡς οὐκ ἐπιτήδειον εἰς οἰκίαν εἰσφέρειν· δυσθανατεῖν γάρ φασι καὶ δυστοκεῖν οὐν ἄν τοι.

4 Τῆς δὲ φιλύρας ἡ μὲν ἄρρην ἔστι τοι ἡ δὲ θήλεια· διαφέρουσι δὲ τῇ μορφῇ τῇ ὄλῃ καὶ τῇ τοῦ ἔξιλου καὶ τῷ τὸ μὲν εἶναι κάρπιμον τὸ δὲ ἄκαρπον. τὸ μὲν γάρ τῆς ἄρρενος ἔξιλον σκληρὸν καὶ ἔανθόν καὶ ὀξωδέστερον καὶ πυκνότερόν ἔστι, ἔτι δὲ εὐωδέστερον, τὸ δὲ τῆς θηλείας λευκότερον. καὶ ὁ φλοιὸς τῆς μὲν ἄρρενος παχύτερος καὶ περιαιρεθεὶς ἀκαμπής διὰ τὴν σκληρότητα, τῆς δὲ θηλείας λεπτότερος καὶ εύκαμπτης, ἔξι οὖν τὰς κίστας ποιοῦσιν· καὶ ἡ μὲν ἄκαρπος καὶ ἀνανθής, ἡ δὲ θήλεια καὶ ἄνθος ἔχει καὶ καρπόν· τὸ μὲν ἄνθος καλυκῶδες παρὰ τὸν τοῦ φύλλου μίσχον καὶ παρὰ

¹ cf. 1. 8. 2 (ὄστρυνος), 3. 3. 1; C.P. 5. 12. 9 (ὄστρυνη); Plin. 13. 117.

² μέσης . . . κατατεινουσῶν conj. Sch.; μέσης πλευροειδῶς τῶν ἄλλων εὐθείῶν καὶ μεγάλην κατατεινουσῶν Ald. cf. 1. 10. 2; 3. 17. 3.

ENQUIRY INTO PLANTS, III. x. 3-4

The *ostrya* (hop-hornbeam),¹ which some call *ostrya*, has also but one kind: it is like the beech in growth and bark; its leaves are in shape like a pear's, except that they are much longer, come to a sharp point, are larger, and have many fibres, which branch out like ribs from a large straight one² in the middle, and are thick; also the leaves are wrinkled along the fibres and have a finely serrated edge; the wood is hard colourless and whitish; the fruit is small oblong and yellow like barley; it has shallow roots; it loves water and is found in ravines. It is said to be unlucky to bring it into the house, since, wherever it is, it is supposed to cause a painful death³ or painful labour in giving birth.

⁴ The lime has both 'male' and 'female' forms, which differ in their general appearance, in that of the wood, and in being respectively fruit-bearing and sterile. The wood of the 'male' tree is hard yellow more branched closer, and also more fragrant⁵; that of the 'female' is whiter. The bark of the 'male' is thicker, and, when stripped off, is unbending because of its hardness; that of the 'female' is thinner⁶ and flexible; men make their writing-cases⁷ out of it. The 'male' has neither fruit nor flower, but the 'female' has both flower and fruit; the flower is cup-shaped, and appears alongside of the stalk of the leaf, or alongside of next year's

³ δυσθανατεῖν I conj. ; δυσθάνατον P₂ Ald.; δυσθανατᾶν conj. Sch., but δυσθανατᾶν has a desiderative sense.

⁴ Plin. 16. 65.

⁵ ἔτι δ' εὐωδ. inserted here by Sch.; cf. Plin., *l.c.* In Ald. the words, with the addition τὸ τῆς θηλεῖας, occur after ποιῶσιν.

⁶ λεπτότερος conj. Sch; λευκότερος Ald.

⁷ cf. 3. 13. 1; Ar. *Vesp.* 529.

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τὴν εἰς νέωτα κάχρυν ἐφ' ἑτέρου μίσχου, χλοερὸν δὲ ὅταν ἡ καλυκῶδες, ἐκκαλυπτόμενον δὲ ἐπίξανθον ἡ δὲ ἄνθησις ἀμα τοῖς ἡμέροις. ὁ δὲ καρπὸς στρογγύλος πρόμακρος ἡλίκος κύαμος ὅμοιος τῷ τοῦ κιττοῦ, γωνίας ἔχων ὁ ἀδρὸς πέντε οἰον ἵνων ἔξεχουσῶν καὶ εἰς ὀξὺ συναγομένων. ὁ δὲ μὴ ἀδρὸς ἀδιαρθρότερος· διακνιζόμενος δὲ ὁ ἀδρὸς ἔχει μίκρον ἄττα καὶ λεπτὰ σπερμάτια ἡλίκα καὶ ὁ τῆς ἀδραφάξυος. τὸ δὲ φύλλον καὶ ὁ φλοιὸς ἥδεα καὶ γλυκέα· τὴν δὲ μορφὴν κιττῶδες τὸ φύλλον, πλὴν ἐκ προσαγωγῆς μᾶλλον ἡ περιφέρεια, κατὰ τὸ πρὸς τῷ μίσχῳ κυρτότατον, ἀλλὰ κατὰ μέσον εἰς ὀξύτερον τὴν συναγωγὴν ἔχον καὶ μακρότερον, ἐπουλον δὲ κύκλῳ καὶ κεχαραγμένον. μήτραν δὲ ἔχει τὸ ξύλον μικρὰν καὶ οὐ πολὺ μαλακωτέραν τοῦ ἄλλου· μαλακὸν γάρ καὶ τὸ ἄλλο ξύλον.

XI. Τῆς δὲ σφενδάμνου, καθάπερ εἴπομεν, δύο γένη ποιοῦσιν, οἱ δὲ τρία· ἐν μὲν δὴ τῷ κοινῷ προσαγορεύουσι σφένδαμνον, ἐτερον δὲ ζυγίαν, τρίτον δὲ κλινότροχον, ὡς οἱ περὶ Στάγειρα. διαφορὰ δὲ ἐστὶ τῆς ζυγίας καὶ τῆς σφενδάμνου ὅτι ἡ μὲν σφένδαμνος λευκὸν ἔχει τὸ ξύλον καὶ εὐινότερον, ἡ δὲ ζυγία ξανθὸν καὶ οὐλον· τὸ δὲ φύλλον εὐμέγεθες ἀμφω, τῇ σχίσει ὅμοιον τῷ

¹ cf. 3. 5. 5. and 6.

² διακνιζόμενος: διασχιζόμενος, 'when split open,' conj. W.

³ cf. 1. 12. 4; C.P. 6. 12. 7. ⁴ 3. 3. 1.

⁵ προσαγορεύουσι conj. W. from G; προσαγορεύεται Ald.

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winter-bud¹ on a separate stalk ; it is green, when in the cup-like stage, but brownish as it opens ; it appears at the same time as in the cultivated trees. The fruit is rounded oblong as large as a bean, resembling the fruit of the ivy ; when mature, it has five angular projections, as it were, made by projecting fibres which meet in a point ; the immature fruit is less articulated. When the mature fruit is pulled to pieces,² it shows some small fine seeds of the same size as those of orach. The leaf and the bark³ are well flavoured and sweet ; the leaf is like that of the ivy in shape, except that it rounds more gradually, being most curved at the part next the stalk, but in the middle contracting to a sharper and longer apex, and its edge is somewhat puckered and jagged. The timber contains little core, which is not much softer than the other part ; for the rest of the wood is also soft.

Of maple and ash.

XI. Of the maple, as we have said,⁴ some make⁵ two kinds, some three ; one they call by the general name ‘maple,’ another *zygia*, the third *klinotrokhos*⁶ ; this name, for instance, is used by the people of Stagira. The difference between *zygia* and maple proper is that the latter has white wood of finer fibre, while that of *zygia* is yellow and of compact texture. The leaf⁷ in both trees is large, resembling that of the plane in the way in which it is

⁶ κλινότροχον Ald. ; κλινόστροχον U ; ινότροχον conj. Salm. from Plin. 16. 66 and 67, *cursivenium* or *crassivenium*. Sch. thinks that the word conceals γλίνος ; cf. 3. 3. 1 ; 3. 11. 2.

⁷ φύλλον conj. R. Const. ; ξύλον UMVAld. H.G.

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τῆς πλατάνου τετανὸν λεπτότερον δὲ καὶ ἀσαρκότερον καὶ μαλακώτερον καὶ προμηκέστερον¹ τὰ δὲ σχίσμα² ὅλα τ' εἰς ὁξὺ συνήκοντα καὶ οὐχ οὕτω μεσοσχιδῆ ἀλλ' ἀκροσχιδέστερα· οὐ πολὺν³ δὲ ώς κατὰ μέγεθος. ἔχει δὲ καὶ φλοιὸν μικρῷ τραχύτερον τοῦ τῆς φιλύρας, ὑποπέλιον παχὺν καὶ πυκνότερον ἥ ὁ τῆς πίτυος καὶ ἀκαμπῆ· ρίζαι δὲ ὀλίγαι καὶ μετέωροι καὶ οὐλαι σχεδὸν αἱ πλεῖσται⁴ καὶ αἱ τῆς ξανθῆς καὶ αἱ τῆς λευκῆς. γίνεται δὲ μάλιστα ἐν τοῖς ἐφύδροις, ὡς οἱ περὶ τὴν⁵ Ἰδην λέγουσι, καὶ ἔστι σπάνιον. περὶ ἀνθους δὲ οὐκ ἥδεσαν· τὸν δὲ καρπὸν οὐ λίαν μὲν προμήκη, παρόμοιον δὲ τῷ παλιούρῳ πλὴν προμηκέστερον. οἱ δὲ ἐν τῷ Ὀλύμπῳ τὴν μὲν ζυγίαν ὅρειον μᾶλλον, τὴν δὲ σφένδαμνον καὶ ἐν τοῖς πεδίοις φυεσθαι· εἰναι δὲ τὴν μὲν ἐν τῷ ὅρει φυομένην ξανθὴν καὶ εὔχρουν καὶ οὐλην καὶ στερεάν, ἥ καὶ πρὸς τὰ πολυτελῆ τῶν ἔργων χρῶνται, τὴν δὲ πεδεινὴν λευκήν τε καὶ μανοτέραν καὶ ἡττον οὐλην· καλοῦσι δὲ αὐτὴν ἔνιοι γλεῦνον, οὐ σφένδαμνον. . . . καὶ τῆς ἄρρενος οὐλότερα τὰ ξύλα συνεστραμμένα, καὶ ἐν τῷ πεδίῳ ταύτην φύεσθαι μᾶλλον καὶ βλαστάνειν πρωτερον.

3 Ἐστι δὲ καὶ μελίας γένη δύο. τούτων δὲ ἥ μὲν ὑψηλὴ καὶ εὐμήκης ἔστι τὸ ξύλον ἔχουσα λευκὸν καὶ εὔνον καὶ μαλακώτερον καὶ ἀνοξό-

¹ τετανὸν: cf. 3. 12. 5; 3. 15. 6.

² σχίσμα³ conj. R. Const. from G; σχίμα³ Ald. Cam.; σχήμα³ Bas., which W. reads.

³ ὅλα: ? δλως.

⁴ i.e. do not run back so far.

⁵ πολὺν³ conj. R. Const.; πολύ· ίνα δὲ Ald.; πολύ· ίνα δὲ M.

divided; it is smooth,¹ but more delicate, less fleshy, softer, longer in proportion to its breadth, and the divisions² all³ tend to meet in a point, while they do not occur so much in the middle of the leaf,⁴ but rather at the tip; and for their size the leaves have not many fibres.⁵ The bark too is somewhat rougher than that of the lime, of blackish colour thick closer⁶ than that of the Aleppo pine and stiff; the roots are few shallow and compact for the most part, both those of the yellow and those of the white-wooded tree. This tree occurs chiefly in wet ground,⁷ as the people of Mount Ida say, and is rare. About its flower they did⁸ not know, but the fruit, they said, is not very oblong, but like that of Christ's thorn,⁹ except that it is more oblong than that. But the people of Mount Olympus say that, while *zygia* is rather a mountain tree, the maple proper grows also in the plains; and that the form which grows in the mountains has yellow wood of a bright colour, which is of compact texture and hard, and is used even for expensive work, while that of the plains has white wood of looser make and less compact texture. And some call it *gleinos*¹⁰ instead of maple. . . .¹¹ The wood of the 'male' tree is of compacter texture and twisted; this tree, it is said, grows rather in the plain and puts forth its leaves earlier.

¹² There are also two kinds of ash. Of these one is lofty and of strong growth with white wood of good fibre, softer, with less knots, and of more compact

⁶ πυκνότερον conj. Scal. from G; πυρότερον U Ald.

⁷ ἐφύδροις: ὑφύδροις conj. Sch. cf. ὑφαμμος, ὑπόπτερος.

⁸ cf. 3. 9. 6 n.; Intr. p. xx. ⁹ cf. 3. 18. 3.

¹⁰ cf. 3. 3. 1; Plin. 16. 67.

¹¹ W. marks a lacuna: the description of the 'female' tree seems to be missing. ¹² Plin. 16. 62-64.

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τερον καὶ οὐλότερον· ἡ δὲ ταπεινοτέρα καὶ ἡττον
εὐαυξήσ καὶ τραχυτέρα καὶ σκληροτέρα καὶ ξαν-
θοτέρα. τὰ δὲ φύλλα τῷ μὲν σχήματι δαφνοειδῆ,
πλατυφύλλου δάφνης, εἰς ὁξύτερον δὲ συνηγμένα,
χαραγμὸν δέ τιν ἔχοντα κύκλῳ καὶ ἐπακανθί-
ζοντα· τὸ δὲ ὅλον, ὅπερ εἴποι τις ἀν φύλλον τῷ
ἄμα φυλλορροεῖν, ἀφ' ἐνὸς μίσχου· καὶ περὶ⁴
μίαν οἰον ἵνα κατὰ γόνυν καὶ συζυγίαν τὰ φύλλα
καθ' ἔκαστον πέφυκε, συχνῶν διεχουσῶν τῶν
συζυγιῶν, ὁμοίως καὶ ἐπὶ τῆς οἰης. ἔστι δὲ τῶν
μὲν βραχέα τὰ γόνατα καὶ αἱ συζυγίαι τὸ πλήθος
ἐλάττους, τῶν δὲ τῆς λευκῆς καὶ μακρὰ καὶ
πλείους· καὶ τὰ καθ' ἔκαστον φύλλα μακρότερα
καὶ στενότερα, τὴν δὲ χρόαν πρασώδη. φλοιὸν
δὲ λεῖον ἔχει, καπυρὸν δὲ καὶ λεπτὸν καὶ τῇ
χρόᾳ πυρρόν. πυκνόρριζον δὲ καὶ παχύρριζον
καὶ μετέωρον. καρπὸν δὲ οἱ μὲν περὶ τὴν Ἰδην
οὐχ ὑπελάμβανον ἔχειν οὐδὲ ἄνθος· ἔχει δὲ ἐν
λοβῷ λεπτῷ καρπὸν καρυηρὸν ὡς τῶν ἀμυγδα-
λῶν ὑπόπικρον τῇ γεύσει. φέρει δὲ καὶ ἔτερ'
ἄττα οἰον βρύα, καθάπερ ἡ δάφνη, πλὴν στιφρό-
τερα· καὶ ἔκαστον καθ' αὐτὸ σφαιροειδές, ὥσπερ
τὰ τῶν πλατάνων· τούτων δὲ τὰ μὲν περὶ τὸν
καρπόν, τὰ δ' ἀπηρτημένα πολύ, καὶ τὰ πλεῖστα
οῦτω. φύεται δὲ ἡ μὲν λεία περὶ τὰ βαθυάγκη
μάλιστα καὶ ἔφυδρα, ἡ δὲ τραχεῖα καὶ περὶ τὰ ξηρὰ
καὶ πετρώδη. ἔνιοι δὲ καλοῦσι τὴν μὲν μελίαν

¹ οὐλότερον: ἀνουλότερον W. from Sch.'s conj.; ξνουλος does not occur elsewhere, and T. uses μανός as the opposite of οὐλός.

² i.e. instead of considering the leaflet as the unit. For the description cf. 3. 12. 5; 3. 15. 4.

texture¹; the other is shorter, less vigorous in growth, rougher harder and yellower. The leaves in shape are like those of the bay, that is, the broad-leaved bay, but they contract to a sharper point, and they have a sort of jagged outline with sharp points. The whole leaf (if one may consider this as² a 'leaf' because it is all shed at once) grows on a single stalk; on either side of a single fibre, as it were, the leaflets grow at a joint in pairs, which are numerous and distinct, just as in the sorb. In some leaves the joints are short³ and the pairs fewer in number, but in those of the white kind the joint is long and the pairs more numerous, while the leaflets are longer narrower and leek-green in colour. Also this tree has a smooth bark, which is dry thin and red in colour. The roots are matted stout and shallow.⁴ As to the fruit, the people of Ida supposed it to have none, and no flower either; however it has a nut-like fruit in a thin pod, like the fruit of the almond, and it is somewhat bitter in taste. And it also bears certain other things like winter-buds, as does the bay, but they are more solid,⁵ and each separate one is globular, like those of the plane; some of these occur around the fruit, some, in fact the greater number,⁶ are at a distance from it. The smooth kind⁷ grows mostly in deep ravines and damp places, the rough kind occurs also in dry and rocky parts. Some, for instance the Macedonians, call the

¹ *Βραχέα* conj. Scal. from G; *τραχέα* U Ald. H.

² Bod. inserts *οὐ* before *μετέωρον*; cf. 3. 6. 5. (Idaean account.)

³ *στιφρότερα* conj. Dalec.; *στρυφνότερα* MSS.

⁶ *πλεῖστα* conj. R. Const.; *πλεκτὰ* U M V Ald.

⁷ cf. Plin., l.c.

THEOPHRASTUS

τὴν δὲ βουμέλιον, ὥσπερ οἱ περὶ Μακεδονίαν.
μεῖζον δὲ καὶ μανότερον ἡ βουμέλιος, δι’ ὃ καὶ
ἡττον οὐλον. φύσει δὲ τὸ μὲν πεδεινὸν καὶ τραχύ,
τὸ δ’ ὄρεινὸν καὶ λεῖον· ἔστι δὲ ἡ μὲν ἐν τοῖς
ὅρει φυομένη εὔχρονς καὶ λεία καὶ στερεὰ καὶ
γλίσχρα, ἡ δὲ ἐν τῷ πεδίῳ ἄχρονς καὶ μανὴ καὶ
τραχεῖα. (τὸ δὲ ὄλον ὡς εἰπεῖν τὰ δένδρα ὅσα
καὶ ἐν τῷ πεδίῳ καὶ ἐν τῷ ὄρει φύεται, τὰ μὲν
ὅρεινὰ εὔχροά τε καὶ στερεὰ καὶ λεῖα γίνεται,
καθάπερ ὁξύη πτελέα τὰ ἄλλα· τὰ δὲ πεδεινὰ
μανότερα καὶ ἀχρούστερα καὶ χείρω, πλὴν ἀπίου
καὶ μηλέας καὶ ἀχράδος, ὡς οἱ περὶ τὸν "Ολυμπόν
φασι· ταῦτα δὲ ἐν τῷ πεδίῳ κρείττω καὶ τῷ
καρπῷ καὶ τοῖς ξύλοις· ἐν μὲν γὰρ τῷ ὄρει
τραχεῖς καὶ ἀκανθώδεις καὶ ὄξώδεις εἰσίν, ἐν δὲ τῷ
πεδίῳ λειότεροι καὶ μείζους καὶ τὸν καρπὸν ἔχουσι
γλυκύτερον καὶ σαρκωδέστερον· μεγέθει δὲ αἱεὶ¹
μείζω τὰ πεδεινά.)

XII. Κρανείας δὲ τὸ μὲν ἄρρεν τὸ δὲ θῆλυ,
ἥν δὴ καὶ θηλυκρανείαν καλοῦσιν. ἔχουσι δὲ
φύλλον μὲν ἀμυγδαλῆ ὄμοιον, πλὴν λιπωδέστερον
καὶ παχύτερον, φλοιὸν δὲ ἴνωδη λεπτόν· τὸ δὲ
στέλεχος οὐ παχὺ λίαν, ἀλλὰ παραφύει ράβδους
ὥσπερ ἄγνος· ἐλάττους δὲ ἡ θηλυκρανεία καὶ
θαμνωδέστερόν ἔστιν. τοὺς δὲ δέζους ὄμοιάς
ἔχουσιν ἄμφω τῇ ἄγνῳ καὶ κατὰ δύο καὶ κατ’

¹ cf. Plin., l.c., and Index.

² μεῖζον δὲ καὶ μανότερον conj. W. from G; μ. δὲ καὶ μαγέτερα
MVU (? μανότερον); μείζων δὲ καὶ μακροτέρα Ald. H.

one 'ash' (manna-ash), the other 'horse-ash'¹ (ash). The 'horse-ash' is a larger and more spreading² tree, wherefore it is of less compact appearance. It is naturally a tree of the plains and rough, while the other belongs to the mountains and is smooth³; the one which grows on the mountains is fair-coloured smooth hard and stunted, while that of the plains is colourless spreading and rough. (In general one may say of trees that grow in the plain and on the mountain respectively, that the latter are of fair colour hard and smooth,⁴ as beech elm and the rest; while those of the plain are more spreading, of less good colour and inferior, except the pear apple⁵ and wild pear, according to the people of Mount Olympus. These when they grow in the plain are better both in fruit and in wood; for on the mountain they are rough spinous and much branched, in the plain smoother larger and with sweeter and fleshier fruit. However the trees of the plain are always of larger size.)

Of cornelian cherry, cornel, 'cedars,' medlar, thorns, sorb.

XII. Of the cornelian cherry there is a 'male' and a 'female' kind (cornel), and the latter bears a corresponding name. Both have a leaf like that of the almond, but oilier and thicker; the bark is fibrous and thin, the stem is not very thick, but it puts out side-branches like the chaste-tree, those of the 'female' tree, which is more shrubby, being fewer. Both kinds have branches like those of the chaste-tree,

¹ καὶ τραχὺ . . . λεῖον conj. Sch.; καὶ λεῖον . . . τραχὺ Ald.

² λεῖα conj. Mold.; λευκὰ Ald.G.

³ μηλέας conj. Scal., cf. 3. 3. 2; μελίας UMAld.H.

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ἀλλήλους· τὸ δὲ ξύλον τὸ μὲν τῆς κρανείας
ἀκάρδιον καὶ στερεὸν ὅλον, ὅμοιον κέρατι τὴν
πυκνότητα καὶ τὴν ἴσχύν, τὸ δὲ τῆς θηλυκρανείας
ἐντεριώνην ἔχον καὶ μαλακώτερον καὶ κοιλαινό-
2 μενον· δὶ' ὁ καὶ ἀχρεῖον εἰς τὰ ἀκόντια. τὸ δ'
ὕψος τοῦ ἄρρενος δωδεκα μάλιστα πηχέων, ἡλίκη
τῶν σαρισσῶν ἡ μεγίστη· τὸ γὰρ ὅλον στέλεχος
ὕψος οὐκ ἴσχει. φασὶ δὲ οἱ μὲν ἐν τῇ¹ Ιδῃ τῇ Τρωάδῃ
τὸ μὲν ἄρρεν ἄκαρπον εἶναι τὸ δὲ θῆλυ κάρπιμον.
πυρῆνα δ' ὁ καρπὸς ἔχει παραπλήσιον ἐλάα, καὶ
ἐσθιόμενος γλυκὺς καὶ εὐώδης· ἀνθος δὲ δόμοιον
τῷ τῆς ἐλάας, καὶ ἀπανθεῖ δὲ καὶ καρποφορεῖ
τὸν αὐτὸν τρόπον τῷ ἔξ ἐνὸς μίσχου πλείους
ἔχειν, σχεδὸν δὲ καὶ τοῖς χρόνοις παραπλησίως.
οἱ δὲ ἐν Μακεδονίᾳ καρποφορεῖν μὲν ἀμφω φασὶν
τὸν δὲ τῆς θηλείας ἄβρωτον εἶναι· τὰς ρίζας δ'
όμοιας ἔχει ταῖς ἀγνοις ἴσχυρὰς καὶ ἀνωλέθρους.
γίνεται δὲ καὶ περὶ τὰ ἔφυδρα καὶ οὐκ ἐν τοῖς
ξηροῖς μόνον· φύεται δὲ καὶ ἀπὸ σπέρματος καὶ
ἀπὸ παρασπάδος.
3 Κέδρον δὲ οἱ μέν φασιν εἶναι διττήν, τὴν μὲν
Λυκίαν τὴν δὲ Φοινικῆν, οἱ δὲ μονοειδῆ, καθάπερ
οἱ ἐν τῇ¹ Ιδῃ. παρόμοιον δὲ τῇ ἀρκεύθῳ, διαφέρει
δὲ μάλιστα τῷ φύλλῳ· τὸ μὲν γὰρ τῆς κέδρου
σκληρὸν καὶ ὀξὺν καὶ ἀκανθῶδες, τὸ δὲ τῆς ἀρκεύθου
μαλακώτερον· δοκεῖ δὲ καὶ ὑψηλοφυέστερον εἶναι
ἡ ἀρκευθός· οὐ μὴν ἀλλ' ἔνιοι γε οὐ διαιροῦσι

¹ The Idaeans are evidently responsible for this statement. T. himself (3. 4. 3) says the fruit is inedible.

² But (1. 11. 4) only certain varieties of the olive are said to have this character: the next statement seems also inconsistent with 3. 4. 3. Perhaps T. is still reproducing his Idaean authority.

arranged in pairs opposite one another. The wood of the 'male' tree has no heart, but is hard throughout, like horn in closeness and strength; whereas that of the 'female' tree has heart-wood and is softer and goes into holes; wherefore it is useless for javelins. The height of the 'male' tree is at most twelve cubits, the length of the longest Macedonian spear, the stem up to the point where it divides not being very tall. The people of Mount Ida in the Troad say that the 'male' tree is barren, but that the 'female' bears fruit. The fruit has a stone like an olive and is sweet to the taste and fragrant¹; the flower is like that of the olive, and the tree produces its flowers and fruit in the same manner, inasmuch as it has several growing from one stalk,² and they are produced at almost the same time in both forms. However the people of Macedonia say that both trees bear fruit, though that of the 'female' is uneatable, and the roots are like those of the chaste-tree, strong and indestructible. This tree grows in wet ground and not only³ in dry places; and it comes from seed, and also can be propagated from a piece torn off.

⁴ The 'cedar,' some say, has two forms, the Lycian and the Phoenician⁵; but some, as the people of Mount Ida, say that there is only one form. It resembles the *arkethos* (Phoenician cedar), differing chiefly in the leaf, that of 'cedar' being hard sharp and spinous, while that of *arkethos* is softer: the latter tree also seems to be of taller growth. However some do not give them distinct names, but call

³ μόνον ins. R. Const. from G.

⁴ Plin. 13. 52. See Index κέδρος and ἄρκευθος.

⁵ Φοινικῆν: Φοινικικῆν conj. W. cf. 9. 2. 3; Plin. l.c.

THEOPHRASTUS

τοῖς ὀνόμασιν ἀλλ' ἄμφω καλοῦσι κέδρους, πλὴν παρασήμως τὴν κέδρον ὀξύκεδρον. ὀξώδη δ' ἄμφω καὶ πολυμάσχαλα καὶ ἐπεστραμμένα ἔχοντα τὰ ξύλα· μήτραν δ' ή μὲν ἄρκευθος ἔχει μικρὰν καὶ πυκνὴν καὶ ὅταν κοπῆ ταχὺ σηπομένην· ή δὲ κέδρος τὸ πλεῖστον ἐγκάρδιον καὶ ἀσαπές, ἐρυθροκάρδια δ' ἄμφω· καὶ ή μὲν τῆς 4 κέδρου εὐώδης ή δὲ τῆς ἑτέρας οὕ. καρπὸς δ' οὐ μὲν τῆς κέδρου ξανθὸς μύρτου μέγεθος ἔχων εὐώδης ήδὺς ἐσθίεσθαι. οὐ δὲ τῆς ἄρκευθος τὰ μὲν ἄλλα ὅμοιος, μέλας δὲ καὶ στρυφνὸς καὶ ὥσπερ ἄβρωτος· διαμένει δ' εἰς ἐνιαυτόν, εἴθ' ὅταν ἄλλος ἐπιφυῆ ὁ περυσινὸς ἀποπίπτει. ὡς δὲ οἱ ἐν Ἀρκαδίᾳ λέγουσι, τρεῖς ἄμα καρποὺς ἶσχει, τὸν τε περυσινὸν οὕπω πέπονα καὶ τὸν προπερύσινον ἥδη πέπονα καὶ ἐδώδιμον καὶ τρίτον τὸν νέον ὑποφαίνει. ἔφη δὲ Σάτυρος καὶ κομίσαι τοὺς ὀρεοτύπους αὐτῷ ἀνανθεῖς ἄμφω. τὸν δὲ φλοιὸν ὅμοιον ἔχει κυπαρίττῳ τραχύτερον δέ· ρίζας δὲ μανὰς ἄμφοτεραι καὶ ἐπιπολαίους. φύονται περὶ τὰ πετρώδη καὶ χειμέρια καὶ τούτους τοὺς τόπους ζητοῦσι.

5 Μεσπίλης δ' ἔστι τρία γένη, ἀνθηδῶν σατάνειος ἀνθηδονοειδής, ὡς οἱ περὶ τὴν "Ιδην διαιροῦσι. φέρει δὲ ή μὲν σατάνειος τὸν καρπὸν μείζω καὶ λευκότερον καὶ χαυνότερον καὶ τοὺς πυρῆνας ἔχοντα μαλακωτέρους· αἱ δ' ἔτεραι

¹ παρασήμως τὴν κέδρον U; π. τὸν κέδρον M; Ald. omits the article; παρασημασίᾳ κέδρου conj. W.

² μήτραν conj. Sch.; μᾶλλον U M V Ald. Plin., 16. 198, supports μήτραν: he apparently read μήτραν δ' ή μὲν ἀ. ἔχει μᾶλλον

them both 'cedar,' distinguishing them however as 'the cedar'¹ and 'prickly cedar.' Both are branching trees with many joints and twisted wood. On the other hand *arkeuthos* has only a small amount of close core,² which, when the tree is cut, soon rots, while the trunk of 'cedar' consists mainly of heart and does not rot. The colour of the heart in each case is red: that of the 'cedar' is fragrant, but not that of the other. The fruit of 'cedar' is yellow, as large as the myrtle-berry, fragrant, and sweet to the taste. That of *arkeuthos* is like it in other respects, but black, of astringent taste and practically uneatable; it remains on the tree for a year, and then, when another grows, last year's fruit falls off. According to the Arcadians it has three fruits on the tree at once, last year's, which is not yet ripe, that of the year before last which is now ripe and eatable, and it also shews the new fruit. Satyrus³ said that the wood-cutters gathered him specimens of both kinds which were flowerless. The bark is⁴ like that of the cypress but rougher. Both⁵ kinds have spreading shallow roots. These trees grow in rocky cold parts and seek out such districts.

⁶ There are three kinds of *mespile*, *anthedon* (oriental thorn), *sataneios* (medlar) and *anthedonoeides* (hawthorn), as the people of mount Ida distinguish them. ⁷ The fruit of the medlar is larger paler more spongy and contains softer stones; in the other

πυκνήν; but the words *καὶ δταν . . . σηπομένην* (which P. does not render) seem inconsistent. [?] ins. *οὐ* before *ταχὺ* Sch.

³ ? An enquirer sent out by the Lyceum: see Intr. p. xxi.

⁴ ἔχει conj. W.; ἔδόκει Ald.

⁵ ἀμφότεραι conj. W.; ἀμφοτέρας U; ἀμφοτέρους Ald. H.

⁶ Plin. 15. 84.

⁷ cf. C. P. 2. 8. 2; 6. 14. 4; 6. 16. 1.

THEOPHRASTUS

έλάττω τέ τι καὶ εὐωδέστερον καὶ στρυφιότερον, ὥστε δύνασθαι πλείω χρόνον θησαυρίζεσθαι. πυκνότερον δὲ καὶ τὸ ξύλον τούτων καὶ ξανθότερον, τὰ δ' ἄλλα ὅμοιον. τὸ δ' ἄνθος πασῶν ὅμοιον ἀμυγδαλῆ, πλὴν οὐκ ἐρυθρὸν ὥσπερ ἐκεῖνο ἀλλ' ἐγχλωρότερον. μεγέθει μέγα τὸ δένδρον καὶ περίκομον. φύλλον δὲ τὸ μὲν ἐπὶ πολυσχιδὲς δὲ καὶ ἐν ἄκρῳ σελινοειδές, τὸ δ' ἐπὶ τῶν παλαιοτέρων πολυσχιδὲς σφόδρα καὶ ἐγγωνοειδὲς μείζοσι σχίσμασι, τετανὸν ἵνωδες λεπτότερον σελίνου καὶ προμηκέστερον καὶ τὸ ὄλον καὶ τὰ σχίσματα, περικεχαραγμένον δὲ ὄλον μίσχον δ' ἔχει λεπτὸν μακρόν πρὸ τοῦ φυλλορροεῦν δ' ἐρυθραίνεται σφόδρα. πολύρριζον δὲ τὸ δένδρον καὶ βαθύρριζον δι' ὃ καὶ χρόνιον καὶ δυσώλεθρον. καὶ τὸ ξύλον ἔχει πυκνὸν καὶ 6 στερεὸν καὶ ἀσαπές. φύεται δὲ καὶ ἀπὸ σπέρματος καὶ ἀπὸ παρασπάδος. νόσημα δὲ αὐτῶν ἔστιν ὥστε γηράσκοντα σκωληκόβρωτα γίνεσθαι· καὶ οἱ σκώληκες μεγάλοι καὶ ἕδιοι ἢ οἱ ἐκ τῶν δένδρων τῶν ἄλλων.

Τῶν δ' οἵων δύο γένη ποιοῦσι, τὸ μὲν δὴ καρποφόρον θῆλυ τὸ δὲ ἄρρεν ἄκαρπον· οὐ μὴν ἄλλὰ διαφέρουσι τοῖς καρποῖς, τῷ τὰς μὲν στρογγύλον τὰς δὲ προμήκη τὰς δ' ὠσειδῆ φέρειν. διαφέρουσι δὲ καὶ τοῖς χυλοῖς· ὡς γὰρ ἐπὶ τὸ

¹ ἔλαττω τέ τι conj. W.; ἔλαττω εἰσὶν U Ald.

² W. suggests that some words are missing here, as it does not appear to which kind of *μεσπίλη* the following description belongs; hence various difficulties. See Sch.

³ Probably a lacuna in the text. W. thus supplies the sense: he suggests *σικνοειδές* for *σελινοειδές*.

ENQUIRY INTO PLANTS, III. XII. 5-6

kinds it is somewhat smaller,¹ more fragrant and of more astringent taste, so that it can be stored for a longer time. The wood also of these kinds is closer and yellower, though in other respects it does not differ. The flower in all the kinds is like the almond flower, except that it is not pink, as that is, but greenish² In stature the tree is large and it has thick foliage. The leaf in the young tree is round³ but much divided and like celery at the tip; but the leaf of older trees is very much divided and forms angles with larger divisions; it is smooth⁴ fibrous thinner and more oblong than the celery leaf, both as a whole and in its divisions, and it has a jagged edge all round.⁵ It has a long thin stalk, and the leaves turn bright red before they are shed. The tree has many roots, which run deep; wherefore it lives a long time and is hard to kill. The wood is close and hard and does not rot. The tree grows from seed and also from a piece torn off. It is subject to a disease which causes it to become worm-eaten⁶ in its old age, and the worms are large and different⁷ to those engendered by other trees.

⁸ Of the sorb they make two kinds, the 'female' which bears fruit and the 'male' which is barren. There are moreover differences in the fruit of the 'female' kind; in some forms it is round, in others oblong and egg-shaped. There are also differences

⁴ *τετανδν* : cf. 3. 11. 1; 3. 15. 6.

⁵ *περικεχαραγμένον* conj. Scal.; *περικεθαρμένον* U; *περικεκαρμένον* MV Ald. cf. allusions to the leaf of *μεσπίλη*, 3. 13. 1; 3. 15. 6.

⁶ cf. 4. 14. 10; Plin. 17. 221; Pall. 4. 10.

⁷ *ἰδίοι* Ald. (for construction cf. Plat. *Gorg.* 481 c); *ἰδίοις* UMV (the first is corrected in U). W. adopts Sch.'s conj., *ἴδιοις*, in allusion to the edible *cossus*: cf. Plin. *l.c.*

⁸ Plin. 15. 85.

THEOPHRASTUS

πᾶν εὐωδέστερα καὶ γλυκύτερα τὰ στρογγύλα,
τὰ δὲ ὠοειδῆ πολλάκις ἐστὶν ὀξέα καὶ ἥπτου
7 εὐώδη. φύλλα δὲ ἀμφοῖν κατὰ μίσχον μακρὸν
ἰνοειδῆ πεφύκασι στοιχηδὸν ἐκ τῶν πλαγίων
πτερυγοειδῶς, ὡς ἐνὸς ὄντος τοῦ ὅλου λοβούς δὲ
ἔχοντος ἐσχισμένους ἔως τῆς ἴνος· πλὴν διεστάσιν
ἀφ' ἑαυτῶν ὑπόσυχνον τὰ κατὰ μέρος· φυλλο-
βολεῖ δὲ οὐ κατὰ μέρος ἀλλὰ ὅλον ἅμα τὸ
πτερυγῶδες. εἰσὶ δὲ περὶ μὲν τὰ παλαιότερα
καὶ μακρότερα πλείους αἱ συζυγίαι, περὶ δὲ τὰ
νεώτερα καὶ βραχύτερα ἐλάττους, πάντων δὲ ἐπ' ἄκρου τοῦ μίσχου φύλλον περιττόν, ὥστε καὶ
πάντ' εἶναι περιττά. τῷ δὲ σχήματι δαφνοειδῆ
τῆς λεπτοφύλλου, πλὴν χαραγμὸν ἔχοντα καὶ
βραχύτερα καὶ οὐκ εἰς ὀξὺ τὸ ἄκρον συνήκον
ἀλλ' εἰς περιφερέστερον. ἄνθος δὲ ἔχει βοτρυ-
ῶδες ἀπὸ μιᾶς κορύνης ἐκ πολλῶν μικρῶν καὶ
8 λευκῶν συγκείμενον. καὶ ὁ καρπὸς ὅταν εὐκαρπῆ
βοτρυώδης· πολλὰ γὰρ ἀπὸ τῆς αὐτῆς κορύνης,
ώστ' εἶναι καθάπερ κηρίου. σκωληκόβορος ἐπὶ
τοῦ δένδρου ὁ καρπὸς ἅπεπτος ὡν ἔτι γίνεται
μᾶλλον τῶν μεσπίλων καὶ ἀπίων καὶ ἀχράδων·
καίτοι πολὺ στρυφνότατος. γίνεται δὲ καὶ αὐτὸ
τὸ δένδρον σκωληκόβρωτον καὶ οὕτως αὐαίνεται
γηράσκον· καὶ ὁ σκώληξ ἴδιος ἐρυθρὸς δασύς.
καρποφορεῖ δὲ ἐπιεικῶς νέα· τριετής γὰρ εὐθὺς
φύει. τοῦ μετοπώρου δὲ ὅταν ἀποβάλῃ τὸ φύλλον,
εὐθὺς ἵσχει τὴν καχρυώδη κορύνην λιπαρὰν καὶ

¹ φύλλα . . . στοιχηδὸν conj. W.; φύλλον δὲ ἀμφοῖν τὸ μὲν μίσχον μακρὸν ἰνοειδῆ· πεφ. [δὲ] στοιχηδὸν UΜVAlδ.

² ἀφ' ἑαυτῶν (=ἀπ' ἀλλήλων) conj. Scal.; ἀπ' αὐτῶν U: so W., who however renders *inter se*.

ENQUIRY INTO PLANTS, III. XII. 6-8

in taste ; the round fruits are generally more fragrant and sweeter, the oval ones are often sour and less fragrant. The leaves in both grow attached to a long fibrous stalk, and project on each side in a row¹ like the feathers of a bird's wing, the whole forming a single leaf but being divided into lobes with divisions which extend to the rib ; but each pair are some distance apart,² and, when the leaves fall,³ these divisions do not drop separately, but the whole wing-like structure drops at once. When the leaves are older and longer, the pairs are more numerous ; in the younger and shorter leaves they are fewer ; but in all at the end of the leaf-stalk there is an extra leaflet, so that the total number of leaflets is an odd number. In form the leaflets resemble⁴ the leaves of the 'fine-leaved' bay, except that they are jagged and shorter and do not narrow to a sharp point but to a more rounded end. The flower⁵ is clustering and made up of a number of small white blossoms from a single knob. The fruit too is clustering, when the tree fruits well ; for a number of fruits are formed from the same knob, giving an appearance like a honeycomb. The fruit gets eaten by worms on the tree before it is ripe to a greater extent than that of medlar pear or wild pear, and yet it is much more astringent than any of these. The tree itself also gets worm-eaten, and so withers away as it ages ; and the worm⁶ which infests it is a peculiar one, red and hairy. This tree bears fruit when it is quite young, that is as soon as it is three years old. In autumn, when it has shed its leaves, it immediately produces its winter-bud-like knob,⁷

³ Plin. 16. 92.

⁴ For construction *cf.* 3. 11. 3.

⁵ *i.e.* inflorescence.

⁶ Plin. 17. 221.

⁷ *cf.* 3. 5. 5.

THEOPHRASTUS

ἐπωδηκυῖαν ὡσὰν ἥδη βλαστικόν, καὶ διαμένει
 9 τὸν χειμῶνα. ἀνάκανθον δέ ἔστι καὶ ἡ οἴη καὶ
 ἡ μεσπίλη· φλοιὸν δ' ἔχει λεῖον ὑπολίπαρον,
 ὅσπερ μὴ γεράνδρυα, τὴν δὲ χρόαν ἔανθὸν
 ἐπιλευκαίνοντα· τὰ δὲ γεράνδρυα τραχὺν καὶ
 μέλανα. τὸ δὲ δένδρον εὐμέγεθες ὄρθοφυὲς
 εὔρυθμον τῇ κόμῃ· σχεδὸν γὰρ ὡς ἐπὶ τὸ πολὺ¹
 στροβιλοειδὲς σχῆμα λαμβάνει κατὰ τὴν κόμην,
 ἐὰν μή τι ἐμποδίσῃ. τὸ δὲ ξύλον στερεὸν πυκνὸν
 ἴσχυρὸν εὔχρουν, ρίζας δὲ οὐ πολλὰς μὲν οὐδὲ
 κατὰ βάθους, ἴσχυρὰς δὲ καὶ παχείας καὶ ἀνω-
 λέθρους ἔχει. φυεται δὲ καὶ ἀπὸ ρίζης καὶ ἀπὸ²
 παρασπάδος καὶ ἀπὸ σπέρματος· τόπον δὲ ζητεῖ
 ψυχρὸν ἔνικμον, φιλόζωον δ' ἐν τούτῳ καὶ
 δυσώλεθρον· οὐ μῆν ἀλλὰ καὶ φύεται ἐν τοῖς
 ὅρεσιν.

XIII. "Ιδιον δὲ τῇ φύσει δένδρον ὁ κέρασός
 ἔστι· μεγέθει μὲν μέγα· καὶ γὰρ εἰς τέτταρας
 καὶ εἴκοσι πήχεις· ἔστι δ' ὄρθοφυὲς σφόδρα·
 πάχος δὲ ὡστε καὶ δίπτην τὴν περίμετρον ἀπὸ³
 τῆς ρίζης ἔχειν. φύλλον δ' ὅμοιον τῷ τῆς
 μεσπίλης σκληρὸν δὲ σφόδρα καὶ παχύτερον,
 ὡστε τῇ χροιᾷ πόρρωθεν φανερὸν εἶναι τὸ δένδρον.
 φλοιὸν δὲ τὴν λειότητα καὶ τὴν χρόαν καὶ τὸ
 πάχος ὅμοιον φιλύρᾳ, δι' ὃ καὶ τὰς κίστας ἔξ
 αὐτοῦ ποιοῦσιν ὡσπερ καὶ ἐκ τοῦ τῆς φιλύρας.
 περιπέφυκε δὲ οὗτος οὔτε ὄρθοφυὴς οὔτε κύκλῳ
 κατ' ίσον, ἀλλ' ἐλικηδὸν περιείληφε κάτωθεν ἄνω

¹ ὅσπερ μὴ conj. Bod.; ὅσπερ τὰ Ald.; ὅστε τὰ M.

² κόμην Ald. H.; κορυφὴν conj. Sch.; vertice G.

³ Plin. 16. 125; cf. 16. 74; 17. 234.

⁴ παχύτερον: so quoted by Athen. 2. 34; πλατύτερον MSS.

which is glistening and swollen as though the tree were just about to burst into leaf, and this persists through the winter. The sorb, like the medlar, is thornless; it has smooth rather shiny bark, (except when¹ the tree is old), which in colour is a whitish yellow; but in old trees it is rough and black. The tree is of a good size, of erect growth and with well balanced foliage; for in general it assumes a cone-like shape as to its foliage,² unless something interferes. The wood is hard close strong and of a good colour; the roots are not numerous and do not run deep, but they are strong and thick and indestructible. The tree grows from a root, from a piece torn off, or from seed, and seeks a cold moist position; in such a position it is tenacious of life and hard to kill: however it also grows on mountains.

Of bird-cherry, elder, willow.

XIII. ³ The *kerasos* (bird-cherry) is peculiar in character; it is of great stature, growing as much as twenty-four cubits high; and it is of very erect growth; as to thickness, it is as much as two cubits in circumference at the base. The leaves are like those of the medlar, but very tough and thicker,⁴ so that the tree is conspicuous by its colour from a distance. The bark⁵ in smoothness colour and thickness is like that of the lime; wherefore men make their writing-cases⁶ from it, as from the bark of that tree. ⁷ This bark does not grow straight nor evenly all round the tree, but runs round it⁸ in a spiral

⁵ cf. 4. 15. 1; Hesych. s.v. *κέρασος*.

⁶ cf. 3. 10. 4; Ar. *Vesp.* 529.

⁷ περιπέφυκε . . . περιπεφυκός: text as restored by Sch. and others, following U as closely as possible.

⁸ περιείληφε conj. R. Const.

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προσάγων, ὥσπερ ἡ διαγραφὴ τῶν φύλλων· καὶ λοπιζόμενος οὗτος ἐκδέρεται, ἐκεῖνος δὲ ἐπίτομος¹ γίνεται καὶ οὐ δύναται· μέρος δὲ αὐτοῦ τι τὸν αὐτὸν τρόπον ἀφαιρεῖται κατὰ πάχος σχιζόμενον λεπτὸν ὡς ἀν φύλλον, τὸ δὲ λοιπὸν προσμένει τε δύναται καὶ σώζει τὸ δένδρον ὡσαύτως περιπεφυκός. περιαιρουμένου δὲ ὅταν λοπά τοῦ φλοιοῦ συνεκραίνει καὶ τότε τὴν ὑγρότητα· καὶ ὅταν ὁ ἔξω χιτῶν περιαιρεθῇ, μόνον ὁ ὑπολιπῆς ἐπιμελαίνεται ὥσπερ μυξώδει ὑγρασίᾳ, καὶ πάλιν ὑποφύεται τῷ δευτέρῳ ἔτει χιτῶν ἄλλος ἀντ’ ἐκείνου πλὴν λεπτότερος. πέφυκε καὶ τὸ ξύλον δμοιον ταῖς ἵστι τῷ φλοιῷ στρεπτῶς ἐλιττόμενον· καὶ οἱ ράβδοι φύονται τὸν αὐτὸν τρόπον εὐθύς· τοὺς δέξιους δὲ αὐξανομένου συμβαίνει τοὺς μὲν κάτω ἀεὶ ἀπόλυτοι τοὺς δὲ ἄνω αὔξειν. τὸ δὲ δόλον οὐ πολύοξον τὸ δένδρον ἀλλ’ ἀνοξότερον πολὺ τῆς αἰγείρου. πολύρριζον δὲ καὶ ἐπιπολαιόρριζον οὐκ ἄγαν δὲ παχύρριζον· ἡ δὲ ἐπιστροφὴ καὶ τῆς ρίζης καὶ τοῦ φλοιοῦ τοῦ περὶ αὐτὴν ἡ αὐτή. ἄνθος δὲ λευκὸν ἀπίφ καὶ μεσπίλη δμοιον, ἐκ μικρῶν ἀνθῶν συγκείμενον κηριώδεις. ὁ δὲ καρπὸς ἐρυθρὸς δμοιος διοσπύρῳ τὸ σχῆμα, τὸ δὲ μέγεθος ἥλικον κύαμος, πλὴν τοῦ διοσπύρου μὲν ὁ πυρὴν σκληρὸς τοῦ δὲ κεράσου μαλακός. φύεται δὲ ὅπου καὶ ἡ φίλυρα, τὸ δὲ δόλον ὅπου ποταμοὶ καὶ ἔφυδρα.

4 Φύεται δὲ καὶ ἡ ἀκτὴ μάλιστα παρ’ ὕδωρ καὶ

¹ Which is an ellipse, the segment of a cylinder: so Sch. explains.

² ἐκεῖνος: i.e. lower down the trunk, where the spiral is less open. ³ ἐπίτομος: cf. 5. 1. 12.

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(which becomes closer as it gets higher up the tree) like the outline of the leaves.¹ And this part of it can be stripped off by peeling, whereas with the other part² this is not possible and it has to be cut in short lengths.³ In the same manner part is removed by being split off in flakes as thin as a leaf, while the rest can be left and protects the tree, growing about it as described. If the bark is stripped off when the tree is peeling, there is also at the time a discharge of the sap; further, when only the outside coat is stripped off, what remains turns black with a kind⁴ of mucus-like moisture; and in the second year another coat grows to replace what is lost, but this is thinner. The wood in its fibres is like the bark, twisting spirally,⁵ and the branches grow in the same manner from the first; and, as the tree grows, it comes to pass that the lower branches keep on perishing, while the upper ones increase. However the whole tree is not much branched, but has far fewer branches than the black poplar. Its roots are numerous and shallow and not very thick; and there is a similar twisting of the root and of the bark which surrounds it.⁶ The flower is white, like that of the pear and medlar, composed of a number of small blossoms arranged like a honeycomb. The fruit is red, like that of *diospyros* in shape, and in size it is as large as a bean. However the stone of the *diospyros* fruit is hard, while that of the bird-cherry is soft. The tree grows where the lime grows, and in general where there are rivers and damp places.

⁷The elder also grows chiefly by water and in shady

¹ ἀσπερ conj. Sch.; περ MV; πως Ald. H.

² στρεπτῶς ἐλιττόμενον conj. Sch.; στρεπτῷ ἐλιττομένῳ U; στρεπτῷ ἐλιττομένῳ Ald. ⁶ cf. 3. 12. 7. ⁷ Plin. 17. 151.

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ἐν τοῖς σκιεροῖς, οὐ μὴν ἀλλὰ καὶ ἐν τοῖς μὴ τοιούτοις· θαμνῷδες δὲ ῥάβδοις ἐπετείοις αὐξανομέναις μέχρι τῆς φυλλορροίας εἰς μῆκος, εἴτα μετὰ ταῦτα εἰς πάχος· τὸ δὲ ὅψις τῶν ῥάβδων οὐ μέγα λίαν ἀλλὰ καὶ μάλιστα ὡς ἐξάπηχυτῶν δὲ στελεχῶν πάχος τῶν γερανδρύων ὅσον περικεφαλαίας, φλοιὸς δὲ λείος λεπτὸς καπυρός· τὸ δὲ ξύλον χαῦνον καὶ κοῦφον ξηρανθέν, ἐντεριώνην δὲ ἔχον μαλακήν, ὥστε δι' ὅλου καὶ κοιλαίνεσθαι τὰς ῥάβδους, ἐξ ὧν καὶ τὰς βακτηρίας ποιοῦσι τὰς κούφας. ξηρανθὲν δὲ ἴσχυρὸν καὶ ἀγήρων ἐὰν βρέχηται, κανὸν ἢ λελοπισμένον· λοπίζεται δὲ αὐτόματον ξηραινόμενον. ρίζας δὲ ἔχει μετεώρους οὐ πολλὰς δὲ οὐδὲ μεγάλας.
 5 φύλλον δὲ τὸ μὲν καθ' ἔκαστον μαλακόν, πρόμηκες ὡς τὸ τῆς πλατυφύλλου δάφνης, μεέζον δὲ καὶ πλατύτερον καὶ περιφερέστερον ἐκ μέσου καὶ κάτωθεν, τὸ δ' ἄκρον εἰς ὀξὺ μᾶλλον συνήκον κύκλῳ δ' ἔχον χαραγμόν· τὸ δὲ ὅλον, περὶ ἓνα μίσχον παχὺν καὶ ἴνῳδη ὡσὰν κλωνίον τὰ μὲν ἔνθεν τὰ δὲ ἔνθεν κατὰ γόνυν καὶ συζυγίαν πεφύκασι τῶν φύλλων διέχοντα ἀπ' ἀλλήλων, ἐν δὲ ἐξ ἄκρου τοῦ μίσχου. ὑπέρυθρα δὲ τὰ φύλλα ἐπιεικῶς καὶ χαῦνα καὶ σαρκώδη· φυλλορροεῖ δὲ τοῦτο ὅλον, διόπερ φύλλον ἄν τις εἴποι τὸ ὅλον. ἔχουσι δὲ καὶ οἱ κλῶνες οἱ νέοι γωνοειδῆ τινα.
 6 τὸ δ' ἄνθος λευκὸν ἐκ μικρῶν λευκῶν πολλῶν ἐπὶ τῇ τοῦ μίσχου σχίσει κηριώδεις· εὐωδίαν

¹ περικεφαλαίας, some part of a ship's prow: so Pollux.

² καπυρός conj. Sch.; καὶ πυρσός Ζ (?) ; καὶ πυρρός Ζ; καὶ πουρός Μ. ³ Sc. pith.

places, but likewise in places which are not of this character. It is shrubby, with annual branches which go on growing in length till the fall of the leaf, after which they increase in thickness. The branches do not grow to a very great height, about six cubits at most. The thickness of the stem of old trees is about that of the 'helmet'¹ of a ship; the bark is smooth thin and brittle²; the wood is porous and light when dried, and has a soft heart-wood,³ so that the boughs are hollow right through, and men make of them their light walking-sticks. When dried it is strong and durable if it is soaked, even if it is stripped of the bark; and it strips itself of its own accord as it dries. The roots are shallow and neither numerous nor large. The single leaflet is soft and oblong, like the leaf of the 'broad-leaved' bay, but larger broader and rounder at the middle and base, though the tip narrows more to a point and is jagged⁴ all round. The whole leaf is composed of leaflets growing about a single thick fibrous stalk, as it were, to which they are attached at either side in pairs at each joint; and they are separate from one another, while one is attached to the tip of the stalk. The leaves are somewhat reddish porous and fleshy: the whole is shed in one piece; wherefore one may consider the whole structure as a 'leaf.'⁵ The young twigs too have certain crooks⁶ in them. The flower⁷ is white, made up of a number of small white blossoms attached to the point where the stalk divides, in form like a honeycomb, and it has the heavy

⁴ *χαραγμόν* conj. R. Const. from G; *παραγμόν* UMV; *σπασαγμόν* Ald. ⁵ cf. 3. 11. 3 n.

⁶ *γωνοειδῆ* U; *?γωνιοειδῆ*; G seems to have read *γονατοειδῆ*; Sch. considers the text defective or mutilated.

⁷ cf. 3. 12. 7 n.

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δὲ ἔχει λειριώδη ἐπιβαρεῖαν. ἔχει δὲ καὶ τὸν καρπὸν ὁμοίως πρὸς ἐνὶ μίσχῳ παχεῖ βοτρυώδη δέ· γίνεται δὲ καταπεπαινόμενος μέλας, ὡμὸς δὲ ὃν ὀμφακώδης· μεγέθει δὲ μικρῷ μείζων ὄρόβον· τὴν ὑγρασίαν δὲ οἰνώδη τῇ ὄψει· καὶ τὰς χεῖρας τελειούμενοι βάπτονται καὶ τὰς κεφαλάς· ἔχει δὲ καὶ τὰ ἐντὸς σησαμοειδῆ τὴν ὄψιν.

7 Πάρυδρον δὲ καὶ ἡ ἵτεα καὶ πολυειδές· ἡ μὲν μέλαινα καλουμένη τῷ τὸν φλοιὸν ἔχειν μέλανα καὶ φοινικοῦν, ἡ δὲ λευκὴ τῷ λευκόν. καλλίους δὲ ἔχει τὰς ῥάβδους καὶ χρησιμωτέρας εἰς τὸ πλέκειν ἡ μέλαινα, ἡ δὲ λευκὴ καπυρωτέρας. ἔστι δὲ καὶ τῆς μελαίνης καὶ τῆς λευκῆς ἔνιον γένος μικρὸν καὶ οὐκ ἔχον αὐξησιν εἰς ὑψος, ὥσπερ καὶ ἐπ' ἄλλων τοῦτο δένδρων, οἷον κέδρου φοίνικος. καλοῦσι δ' οἱ περὶ Ἀρκαδίαν οὐκ ἵτεαν ἄλλὰ ἐλίκην τὸ δένδρον· οἴονται δέ, ὥσπερ ἐλέχθη, καὶ καρπὸν ἔχειν αὐτὴν γόνιμον.

XIV. Ἔστι δὲ τῆς πτελέας δύο γένη, καὶ τὸ μὲν ὀρειπτελέα καλεῖται τὸ δὲ πτελέα· διαφέρει δὲ τῷ θαμνωδέστερον εἶναι τὴν πτελέαν εὐαυξέστερον δὲ τὴν ὀρειπτελέαν. φύλλον δὲ ἀσχιδὲς περικεχαραγμένον ἡσυχῆ, προμηκέστερον δὲ τοῦ τῆς ἀπίου,

¹ καταπεπαινόμενος conj. W. ; καὶ πεπ. V Ald.

² καὶ . . . βάπτονται I conj., following Scal., W., etc., but keeping closer to U: certain restoration perhaps impossible; καὶ τὰς χεῖρας τελείους ἀναβλάστει δὲ καὶ τὰς κεφαλάς Ή ; χεῖρας δὲ τελείους ἀναβλαστεῖ ΜV ; om. G.

³ Plin. 16. 174 and 175.

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fragrance of lilies. The fruit is in like manner attached to a single thick stalk, but in a cluster: as it becomes quite ripe,¹ it turns black, but when unripe it is like unripe grapes; in size the berry is a little larger than the seed of a vetch; the juice is like wine in appearance, and in it men bathe² their hands and heads when they are being initiated into the mysteries. The seeds inside the berry are like sesame.

³ The willow also grows by the water, and there are many kinds. There is that which is called the black willow⁴ because its bark is black and red, and that which is called the white⁴ from the colour of its bark. The black kind has boughs which are fairer and more serviceable for basket-work, while those of the white are more brittle.⁵ There is a form both of the black and of the white which is small and does not grow to a height,—just as there are dwarf forms of other trees, such as prickly cedar and palm. The people of Arcadia call the tree⁶ not 'willow' but *helike*: they believe, as was said,⁷ that it bears fruitful seed.

Of elm, poplars, alder, [semyda, bladder-senna].

XIV. ⁸ Of the elm there are two kinds, of which one is called the 'mountain elm,' the other simply the 'elm': the difference is that the latter is shrubbier, while the mountain elm grows more vigorously. The leaf is undivided and slightly jagged, longer than that of the pear, but rough

⁴ See Index.

⁵ κακυρωτέρας conj. Sch.; καὶ πυρωτέρας U; καὶ πυροτέρας MVAld. cf. 3. 13. 4.

⁶ Sc. *ιτέα* generally.

⁷ 3. 1. 2.

⁸ Plin. 16. 72.

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τραχὺ δὲ καὶ οὐ λεῖον. μέγα δὲ τὸ δένδρον καὶ τῷ ὕψει καὶ τῷ μεγέθει. πολὺ δὲ οὐκ ἔστι περὶ τὴν Ἰδην ἀλλὰ σπάνιον τόπον δὲ ἔφυδρον φιλεῖ. τὸ δὲ ξύλον ξανθὸν καὶ ἵσχυρὸν καὶ εὔινον καὶ γλίσχρον· ἄπαν γὰρ καρδία· χρῶνται δὲ αὐτῷ καὶ πρὸς θυρώματα πολυτελῆ, καὶ χλωρὸν μὲν εὔτομον ξηρὸν δὲ δύστομον. ἄκαρπον δὲ νομίζουσιν, ἀλλ' ἐν ταῖς κωρυκίσι τὸ κόμμι καὶ θηρῖ ἄττα κωνωποειδῆ φέρει. τὰς δὲ κάχρυς ἴδιας ἴσχει τοῦ μετοπώρου πολλὰς καὶ μικρὰς καὶ μελαίνας, ἐν δὲ ταῖς ἄλλαις ὥραις οὐκ ἐπέσκεπται.

2 Ἡ δὲ λεύκη καὶ ἡ αἰγειρος μονοειδής, ὄρθοφυὴ δὲ ἄμφω, πλὴν μακρότερον πολὺ καὶ μανότερον καὶ λειότερον ἡ αἰγειρος, τὸ δὲ σχῆμα τῶν φύλλων παρόμοιον. ὅμοιον δὲ καὶ τὸ ξύλον τεμνόμενον τῇ λευκότητι. καρπὸν δὲ οὐδέτερον τούτων οὐδὲ ἄνθος ἔχειν δοκεῖ.

Ἡ κερκὶς δὲ παρόμοιον τῇ λεύκῃ καὶ τῷ μεγέθει καὶ τῷ τοὺς κλάδους ἐπιλεύκους ἔχειν· τὸ δὲ φύλλον κιττώδες μὲν ἀγώνιον δὲ ἐκ τοῦ ἄλλου, τὴν δὲ μίαν προμήκη καὶ εἰς ὀξὺ συνήκουσαν· τῷ δὲ χρώματι σχεδὸν ὅμοιον τὸ ὅπτιον καὶ τὸ πρανές· μίσχῳ δὲ προσηρτημένον μακρῷ καὶ λεπτῷ, δι' ὃ καὶ οὐκ ὄρθον ἀλλ' ἐγκεκλιμένον. φλοιὸν δὲ τραχύτερον τῆς λεύκης καὶ μᾶλλον ὑπόλεπτον, ὥσπερ ὁ τῆς ἀχράδος. ἄκαρπον δέ.

3 Μονογενὲς δὲ καὶ ἡ κλήθρα· φύσει δὲ καὶ

¹ γλίσχρον conj. St.; αἰσχρόν Ald. H. cf. 5. 3. 4.

² cf. 5. 5. 2.

³ cf. τὸ θυλακῷδες τοῦτο, 3. 7. 3; 2. 8. 3 n.; 9. 1. 2.

rather than smooth. The tree is large, being both tall and wide-spreading. It is not common about Ida, but rare, and likes wet ground. The wood is yellow strong fibrous and tough¹; for it is all heart. Men use it for expensive doors²: it is easy to cut when it is green, but difficult when it is dry. The tree is thought to bear no fruit, but in the 'wallets'³ it produces its gum and certain creatures like gnats; and it has in autumn its peculiar 'winter-buds'⁴ which are numerous small and black, but these have not been observed at other seasons.

The abele and the black poplar have each but a single kind: both are of erect growth, but the black poplar is much taller and of more open growth, and is smoother, while the shape of its leaves is similar to those of the other. The wood also of both, when cut, is much the same in whiteness. Neither of these trees appears to have fruit or flower.⁵

The aspen is a tree resembling the abele both in size and in having whitish branches, but the leaf is ivy-like: while however it is otherwise without angles, its one angular⁶ projection is long and narrows to a sharp point: in colour the upper and under sides are much alike. The leaf is attached to a long thin stalk: wherefore the leaf is not set straight, but has a droop.⁷ The bark of the abele is rougher and more scaly, like that of the wild pear, and it bears no fruit.

The alder also has but one form: in growth it is

⁴ κάχρυς, here probably a gall, mistaken for winter-bud.

⁵ cf., however, 3. 3. 4; 4. 10. 2, where T. seems to follow a different authority.

⁶ Supply γωνίαν from ἀγώνιον.

⁷ ἐγκεκλιμένον: sc. is not in line with the stalk.

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όρθοφυές, ξύλον δ' ἔχον μαλακὸν καὶ ἐντεριώνην
μαλακήν, ὥστε δι' ὅλου κοιλαιίνεσθαι τὰς λεπτὰς
ράβδους. φύλλον δ' ὄμοιον ἀπίω, πλὴν μεῖζον
καὶ ἴνωδέστερον. τραχύφλοιον δὲ καὶ ὁ φλοιὸς
ἔσωθεν ἐρυθρός, δι' ὃ καὶ βάπτει τὰ δέρματα.
ρίζας δὲ ἐπιπολαίους . . . ἡλίκου δάφνης. φύεται
δὲ ἐν τοῖς ἐφύδροις ἀλλόθι δ' οὐδαμοῦ.

4 [Σημύδα δὲ τὸ μὲν φύλλον ἔχει ὄμοιον τῇ
Περσικῇ καλουμένῃ καρυα πλὴν μικρῷ στενότε-
ρον, τὸν φλοιὸν δὲ ποικίλον, ξύλον δὲ ἐλαφρόν.
χρήσιμον δὲ εἰς βακτηρίας μόνον εἰς ἄλλο δὲ
οὐδέν.

‘Η δὲ κολυτέα ἔχει τὸ μὲν φύλλον ἐγγὺς τοῦ
τῆς ἴτεας, πολύοξον δὲ καὶ πολύφυλλον καὶ τὸ
δένδρον ὅλως μέγα· τὸν δὲ καρπὸν ἔλλοβον,
καθάπερ τὰ χεδροπά· λοβοῖς γὰρ πλατέσι καὶ
οὐ στενοῖς τὸ σπερμάτιον τὸ ἐνὸν μικρὸν καὶ οὐ
μέγα· σκληρὸν δὲ μετρίως οὐκ ἄγαν· οὐδὲ πολύ-
καρπον ὡς κατὰ μέγεθος. σπάνιον δὲ τὸ ἐν
λοβοῖς ἔχειν τὸν καρπόν· ὀλίγα γὰρ τοιαῦτα τῶν
δένδρων.]

XV. ‘Η δὲ Ἡρακλεωτικὴ καρύα—φύσει γὰρ
καὶ τοῦτ’ ἄγριον τῷ τε μηδὲν ἡ μὴ πολὺ
χείρω γίνεσθαι <ἢ> τῶν ἡμέρων τὸν καρπόν, καὶ
τῷ δύνασθαι χειμῶνας ὑποφέρειν καὶ τῷ πολὺ¹
φύεσθαι κατὰ τὰ ὅρη καὶ πολύκαρπον ἐν τοῖς
ὅρείοις· ἔτι δὲ τῷ μηδὲ στελεχώδες ἀλλὰ θαμ-

¹ Part of the description of the flower, and perhaps of the fruit, seems to be missing. Sch.

² cf. 4. 8. 1; but in 1. 4. 3 the alder is classed with ‘amphibious’ trees, and in 3. 3. 1 with ‘trees of the plain.’

³ *Betulam*, G from Plin. 16. 74.

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also erect, and it has soft wood and a soft heart-wood, so that the slender boughs are hollow throughout. The leaf is like that of the pear, but larger and more fibrous. It has rough bark, which on the inner side is red: wherefore it is used for dyeing hides. It has shallow roots . . . ¹ the flower is as large as that of the bay. It grows in wet places² and nowhere else.

The *semyda*³ has a leaf like that of the tree called the 'Persian nut' (walnut), but it is rather narrower: the bark is variegated and the wood light: it is only of use for making walking-sticks and for no other purpose.

The bladder-senna⁴ has a leaf near that of the willow, but is many-branched and has much foliage; and the tree altogether is a large one. The fruit is in a pod, as in leguminous plants: the pods in fact are broad rather than narrow, and the seed in them is comparatively small, and is moderately hard, but not so very hard. For its size the tree does not bear much fruit. It is uncommon to have the fruit in a pod; in fact there are few such trees.

Of filbert, terebinth, box, krataigos.

XV. The filbert is also naturally a wild tree, in that its fruit is little, if at all, inferior to that of the tree in cultivation, that it can stand winter, that it grows commonly on the mountains, and that it bears abundance of fruit in mountain regions⁵; also because it does not make a trunk, but is shrubby with

⁴ Sch. remarks that the description of *κολυτέα* is out of place: cf. 3. 17. 2. W. thinks the whole section spurious. The antitheses in the latter part suggest a different context, in which *κολυτέα* was described by comparison with some other tree. ⁵ *ὅρεοις* conj. W.; *φοραῖς* Ald.

THEOPHRASTUS

νῶδες εἶναι ράβδοις ἄνευ μασχαλῶν καὶ ἀνόζους
μακραῖς δὲ καὶ παχείαις ἐνίαις—οὐ μὴν ἀλλὰ
καὶ ἔξημεροῦται. διαφορὰν δὲ ἔχει τῷ τὸν
καρπὸν ἀποδιδόναι βελτίω καὶ μεῖζον τὸ φύλλον·
κεχαραγμένον δ' ἀμφοῖν· ὁμοιότατον τὸ τῆς
κλήθρας, πλὴν πλατύτερον καὶ αὐτὸ τὸ δένδρον
μεῖζον. καρπιμώτερον δ' αἱὲ γίνεται κατα-
2 κοπτόμενον τὰς ράβδους. γένη δὲ δύο ἀμφοῖν·
αἱ μὲν γὰρ στρογγύλον αἱ δὲ πρόμακρον φέρουσι
τὸ κάρυον· ἐκλευκότερον δὲ τὸ τῶν ἡμέρων. καὶ
καλλικαρπεῖ μάλιστά γ' ἐν τοῖς ἐφύδροις. ἔξη-
μεροῦται δὲ τὰ ἄγρια μεταφυτευόμενα. φλοιὸν
δ' ἔχει λεῖον ἐπιπόλαιον λεπτὸν λιπαρὸν ἵδιως
στιγμὰς λευκὰς ἔχοντα ἐν αὐτῷ· τὸ δὲ ἔύλον
σφόδρα γλίσχρον, ὥστε καὶ τὰ λεπτὰ πάνυ ράβ-
δία περιλοπίσαντες κανέα ποιοῦσι, καὶ τὰ παχέα
δὲ καταξύσαντες. ἔχει δὲ καὶ ἐντεριώνην λεπτὴν
ξανθήν, ἥ κοιλαίνεται. Ἰδιον δ' αὐτῶν τὸ περὶ
τὸν ἰουλον, ὥσπερ εἴπομεν.

3 Τῆς δὲ τερμίνθου τὸ μὲν ἄρρεν τὸ δὲ θῆλυ. τὸ
μὲν οὖν ἄρρεν ἄκαρπον, δι' ὃ καὶ καλοῦσιν ἄρρεν·
τῶν δὲ θηλειῶν ἡ μὲν ἐρυθρὸν εὐθὺς φέρει τὸν
καρπὸν ἡλίκον φακὸν ἀπεπτον, ἡ δὲ χλοερὸν
ἐνέγκαστα μετὰ ταῦτα ἐρυθραίνει, καὶ ἅμα τῇ
ἀμπέλῳ πεπαίνουσα τὸ ἔσχατον ποιεῖ μέλανα,
μέγεθος ἡλίκον κύαμον, ρητινώδη δὲ καὶ θυω-
δέστερον. ἔστι δὲ τὸ δένδρον περὶ μὲν τὴν Ἰδην
καὶ Μακεδονίαν βραχὺ θαμνώδες ἐστραμμένον,
περὶ δὲ Δαμασκὸν τῆς Συρίας μέγα καὶ πολὺ¹
καὶ καλόν· ὅρος γάρ τι φασιν εἶναι πάμμεστον

¹ cf. C.P. 2. 12. 6.

² cf. Geop. 10. 68.

³ λεῖον conj. W.; πλέον UΜV Ald.

ENQUIRY INTO PLANTS, III. xv. 1-3

unbranched stems without knots ; though some of these are long and stout. Nevertheless it also submits to cultivation. The cultivated form differs in producing better fruit and larger leaves ; in both forms the leaf has a jagged edge : the leaf of the alder most closely resembles it, but is broader, and the tree itself is bigger. ¹ The filbert is always more fruitful if it has its slender boughs cut off. ² There are two kinds of each sort ; some have a round, others an oblong nut ; that of the cultivated tree is paler, and it fruits best in damp places. The wild tree becomes cultivated by being transplanted. Its bark is smooth,³ consisting of one layer, thin glossy and with peculiar white blotches on it. The wood is extremely tough, so that men make baskets even of the quite thin twigs, having stripped them of their bark, and of the stout ones when they have whittled them. Also it has a small amount of yellow heart-wood, which makes⁴ the branches hollow. Peculiar to these trees is the matter of the catkin, as we mentioned.⁵

⁶ The terebinth has a 'male' and a 'female' form. The 'male' is barren, which is why it is called 'male' ; the fruit of one of the 'female' forms is red from the first and as large as an unripe⁷ lentil ; the other produces a green fruit which subsequently turns red, and, ripening at the same time as the grapes, becomes eventually black and is as large as a bean, but resinous and somewhat aromatic. About Ida and in Macedonia the tree is low shrubby and twisted, but in the Syrian Damascus, where it abounds, it is tall and handsome ; indeed they say

⁴ § Ald.H. ; η W. with U. cf. 3. 13. 4.

⁵ 3. 7. 3. ⁶ Plin. 13. 54.

⁷ καλ before ηπειρον om. St.

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4 τερμίνθων, ἄλλο δ' οὐδὲν πεφυκέναι. ξύλον δὲ ἔχει γλίσχρον καὶ μίζας ἴσχυρὰς κατὰ βάθους, καὶ τὸ ὅλον ἀνώλεθρον¹ ἄνθος δὲ ὅμοιον τῷ τῆς ἐλάσ, τῷ χρώματι δὲ ἐρυθρόν. φύλλον, περὶ ἓνα μίσχον πλείω δαφνοειδῆ κατὰ συζυγίαν, ὥσπερ καὶ τὸ τῆς οἴης² καὶ τὸ ἔξ ἄκρου περιττόν. πλὴν ἐγγωνιώτερον τῆς οἴης καὶ δαφνοειδέστερον δὲ κύκλῳ καὶ λιπαρὸν ἄπαν ἄμα τῷ καρπῷ. φέρει δὲ καὶ κωρυκώδη τινὰ κοῖλα, καθάπερ ἡ πτελέα, ἐν οἷς θηρίδια ἐγγύγνεται κωνωποειδῆ. ἐγγύγνεται δέ τι καὶ ῥητινώδεις ἐν τούτοις καὶ γλίσχρον³ οὐ μὴν ἐνθεῦτεν γε ἡ ῥητίνη συλλέγεται ἀλλ' ἀπὸ τοῦ ξύλου. ὁ δὲ καρπὸς οὐκ ἀφίσιι ῥητίνης πλῆθος, ἀλλὰ προσέχεται μὲν ταῖς χερσὶ, κανὸν μὴ πλυθῆ μετὰ τὴν συλλογὴν συνέχεται· πλυνόμενος δὲ ὁ μὲν λευκὸς καὶ ἄπεπτος ἐπιπλεῖ, ὁ δὲ μέλας ὑφίσταται.

5 Ἡ δὲ πύξις μεγέθει μὲν οὐ μεγάλη, τὸ δὲ φύλλον ὅμοιον ἔχει μυρρίνῳ. φύεται δὲ ἐν τοῖς ψυχροῖς τόποις καὶ τραχέσι⁴ καὶ γὰρ τὰ Κύτωρα τοιοῦτον, οὐ δὲ πλείστη γίνεται. ψυχρὸς δὲ καὶ ὁ Ὀλυμπος ὁ Μακεδονικός⁵ καὶ γὰρ ἐνταῦθα γίνεται πλὴν οὐ μεγάλη· μεγίστη δὲ καὶ καλλίστη ἐν Κύρωφ· καὶ γὰρ εὐμήκεις καὶ πάχος ἔχουσαι πολὺ παρὰ τὰς ἄλλας. δι' ὁ καὶ τὸ μέλι οὐχ ἥδὺ δέζον τῆς πύξου.

¹ πλείω: sc. φύλλα, in loose apposition to φύλλον. Apparently the leaf is said to resemble that of οἴη in its composite structure, but that of the bay in shape: cf. 3. 12. 7.

² ἄπαν ἄμα conj. W.; ἄμα ἄπαν ŪAld.

³ cf. 2. 8. 3; 3. 7. 3; 3. 14. 1. κωρυκώδη conj. R. Const.; κορυάδη Ald.; κωρυάδη H.; καρυάδη mBas.

that there is a certain hill which is covered with terebinths, though nothing else grows on it. It has tough wood and strong roots which run deep, and the tree as a whole is impossible to destroy. The flower is like that of the olive, but red in colour. The leaf is made up of a number of leaflets,¹ like bay leaves, attached in pairs to a single leaf-stalk. So far it resembles the leaf of the sorb; there is also the extra leaflet at the tip: but the leaf is more angular than that of the sorb, and the edge resembles more the leaf of the bay; the leaf is glossy all over,² as is the fruit. It bears also some hollow bag-like³ growths, like the elm, in which are found little creatures like gnats; and resinous sticky matter is found also in these bags; but the resin is gathered from the wood and not from these. The fruit does not discharge much resin, but it clings to the hands, and, if it is not washed after gathering, it all sticks together; if it is washed, the part which is white and unripe floats,⁴ but the black part sinks.

The box is not a large tree, and it has a leaf like that of the myrtle. It grows in cold rough places; for of this character is Cytoria,⁵ where it is most abundant. The Macedonian Olympus is also a cold region;⁶ for there too it grows, though not to a great size. It is largest and fairest in Corsica,⁷ where the tree grows taller and stouter than anywhere else; wherefore the honey there is not sweet, as it smells of the box.

⁴ ἐπιπλεῖ conj. R. Const. from G; ἐπὶ πλεῖον Ald.; ἐπὶ πλεῖ (erased) U.

⁵ cf. *Cytoria buxifer*, Catull. 4. 13; Plin. 16. 70.

⁶ cf. 5. 7. 7.

⁷ Κύρνῳ conj. R. Const. from Plin. l.c.; Κυρήνῳ U; Κυρήνῃ Ald.

THEOPHRASTUS

ε Πλήθει δὲ πολὺ κράταιγός ἐστιν, οἱ δὲ κράταιγόνα καλοῦσιν ἔχει δὲ τὸ μὲν φύλλον ὅμοιον μεσπίλη τετανόν, πλὴν μεῖζον ἐκείνου καὶ πλατύτερον ἡ προμηκέστερον, τὸν δὲ χαραγμὸν οὐκ ἔχον ὥσπερ ἐκείνο. γίνεται δὲ τὸ δένδρον οὕτε μέγα λίαν οὕτε παχύ· τὸ δὲ ξύλον ποικίλον ἴσχυρὸν ξανθόν· ἔχει δὲ φλοιὸν λεῖον ὅμοιον μεσπίλη· μονόρριζον δὲ εἰς βάθος ὡς ἐπὶ τὸ πολύ. καρπὸν δὲ ἔχει στρογγύλον ἡλίκον ὁ κότινος· πεπαινόμενος δὲ ξανθύνεται καὶ ἐπιμελαίνεται· κατὰ δὲ τὴν γεῦσιν καὶ τὸν χυλὸν μεσπιλῶδες· διόπερ οὸν ἀγρία μεσπίλη δόξειεν ἂν εἶναι. μονοειδὲς δὲ καὶ οὐκ ἔχον διαφοράς.

XVI. Ο δὲ πρῖνος φύλλον μὲν ἔχει δρυῶδες, ἔλαττον δὲ καὶ ἐπακανθίζον, τὸν δὲ φλοιὸν λειότερον δρυός. αὐτὸ δὲ τὸ δένδρον μέγα, καθάπερ ἡ δρῦς, ἐὰν ἔχῃ τόπον καὶ ἔδαφος· ξύλον δὲ πυκνὸν καὶ ἴσχυρόν· βαθύρριζον δὲ ἐπιεικῶς καὶ πολύρριζον. καρπὸν δὲ ἔχει βαλανώδη· μικρὰ δὲ ἡ βάλανος· περικαταλαμβάνει δὲ ὁ νέος τὸν ἔνον· ὅψὲ γὰρ πεπάίνει, δι' ὃ καὶ διφορεῖν τινές φασι. φέρει δὲ παρὰ τὴν βάλανον καὶ κόκκον τινὰ φοινικοῦν· ἵσχει δὲ καὶ ιξίαν καὶ ὑφέαρ· ὥστε ἐνίστε συμβαίνει τέτταρας ἄμα καρπούς ἔχειν αὐτόν, δύο μὲν τοὺς ἑαυτοῦ δύο δὲ ἄλλους τὸν τε τῆς ιξίας καὶ τὸν τοῦ ὑφέαρος. καὶ τὴν

¹ Quoted by Athen. 2. 34; cf. Plin. 16. 120; 26. 99; 27. 62 and 63.

² τετανόν: cf. 3. 11. 1; 3. 12. 5. Athen., l.c., has τεταμένον.

³ ἐκείνο Athen. l.c.; κάκείνο Ald.

⁴ ξανθὸν before ἴσχυρὸν Athen. l.c.

ENQUIRY INTO PLANTS, III. xv. 6-xvi. 1

¹ The *krataigos* is a very common tree; some call it *krataigon*. It has a smooth² leaf like that of the medlar, but longer, and its breadth is greater than its length, while the edge is not jagged like that³ of the medlar. The tree does not grow very tall or thick; its wood is mottled strong and brown⁴; it has a smooth bark like that of the medlar; it has generally a single root, which runs deep. The fruit is round and as large as that of the wild olive⁵; as it ripens it turns brown and black; in taste and flavour it is like that of the medlar; wherefore this might seem to be a sort of wild form of that tree.⁶ There is only one form of it and it shews no variation.

Of certain other oaks, arbutus, andrachne, wig-tree.

XVI. The kermes-oak⁷ has a leaf like that of the oak, but smaller and spinous,⁸ while its bark is smoother than that of the oak. The tree itself is large, like the oak, if it has space and root-room; the wood is close and strong; it roots fairly deep and it has many roots. The fruit is like an acorn, but the kermes-oak's acorn is small; the new one overtakes that of last year, for it ripens late.⁹ Wherefore some say that it bears twice. Besides the acorn it bears a kind of scarlet berry¹⁰; it also has oak-mistletoe¹¹ and mistletoe; so that sometimes it happens that it has four fruits on it at once, two which are its own and two others, namely those of the oak-mistletoe¹¹ and

⁵ κότινος Athen. l.c.; κόψιμος UMVAld.

⁶ μεσπίλη added from Athen. l.c.

⁷ cf. 3. 7. 3. ⁸ cf. 3. 16. 2. ⁹ cf. 3. 4. 1, 4 and 6.

¹⁰ Plin. 16. 32; Simon. ap. Plut. *Theseus* 17.

¹¹ cf. C.P. 2. 17. 1.

THEOPHRASTUS

μὲν ἵξιαν φέρει ἐκ τῶν πρὸς Βορρᾶν, τὸ δὲ ὑφέαρ
ἐκ τῶν πρὸς μεσημβρίαν.

2 Οἱ δὲ περὶ Ἀρκαδίαν δένδρον τι σμίλακα
καλοῦσιν, ὃ ἐστιν ὅμοιον τῷ πρίνῳ, τὰ δὲ φύλλα
οὐκ ἀκανθώδη ἔχει ἀλλ' ἀπαλώτερα καὶ βαθύτερα
καὶ διαφορὰς ἔχοντα πλείους· οὐδὲ τὸ ξύλον
ῶσπερ ἐκεῖνο στερεὸν καὶ πυκνόν, ἀλλὰ καὶ
μαλακὸν ἐν ταῖς ἐργασίαις.

3 “Οἱ δὲ καλοῦσιν οἱ Ἀρκάδες φελλόδρυν τοιάνδε
ἔχει τὴν φύσιν· ὡς μὲν ἀπλῶς εἰπεῖν ἀνὰ μέσον
πρίνου καὶ δρυός ἐστιν· καὶ ἔνιοί γε ὑπολαμβά-
νουσιν εἶναι θῆλυν πρίνον· δι' ὃ καὶ ὅπου μὴ
φύεται πρίνος τούτῳ χρῶνται πρὸς τὰς ἀμάξιας
καὶ τὰ τοιαῦτα, καθάπερ οἱ περὶ Λακεδαιμονία καὶ
Ἡλείαν. καλοῦσι δὲ οἵ γε Δωριεῖς καὶ ἀρίαν τὸ
δένδρον· ἔστι δὲ μαλακώτερον μὲν καὶ μανότερον
τοῦ πρίνου, σκληρότερον δὲ καὶ πυκνότερον τῆς
δρυός· καὶ τὸ χρῶμα φλοϊσθέντος τοῦ ξύλου
λευκότερον μὲν τοῦ πρίνου, οἰνωπότερον δὲ τῆς
δρυός· τὰ δὲ φύλλα προσέοικε μὲν ἀμφοῖν, ἔχει
δὲ μείζω μὲν ἡ ὡς πρίνος ἐλάττω δὲ ἡ ὡς δρῦς·
καὶ τὸν καρπὸν τοῦ μὲν πρίνου κατὰ μέγεθος
ἐλάττω ταῖς ἐλαχίσταις δὲ βαλάνοις ἴσον, καὶ
γλυκύτερον μὲν τοῦ πρίνου πικρότερον δὲ τῆς
δρυός. καλοῦσι δέ τινες τὸν μὲν τοῦ πρίνου καὶ
τὸν ταύτης καρπὸν ἄκυλον, τὸν δὲ τῆς δρυός
βάλανον. μήτραν δὲ ἔχει φανερωτέραν ἡ ὁ
πρίνος· καὶ ἡ μὲν φελλόδρυς τοιαυτὴν τινὰ ἔχει
φύσιν.

¹ Plin. 16. 19. See Index.

² βαθύτερα MSS.; εὐθύτερα conj. Dalec.

³ Plin. l.c. See Index.

of the mistletoe. It produces the oak-mistletoe on the north side and the mistletoe on the south.

The Arcadians have a tree which they call *smilax*¹ (holm-oak), which resembles the kermes-oak, but has not spinous leaves, its leaves being softer and longer² and differing in several other ways. Nor is the wood hard and close like that of the kermes-oak, but quite soft to work.

The tree which the Arcadians call 'cork-oak'³ (holm-oak) has this character:—to put it generally, it is between the kermes-oak and the oak; and some suppose it to be the 'female' kermes-oak; wherefore, where the kermes-oak does not grow, they use this tree for their carts and such-like purposes; for instance it is so used by the peoples of Lacedaemon and Elis. The Dorians also call the tree *aria*.⁴ Its wood is softer and less compact than that of the kermes-oak, but harder and closer than that of the oak. When it is barked,⁵ the colour of the wood is paler than that of the kermes-oak, but redder than that of the oak. The leaves resemble those of both trees, but they are somewhat large, if we consider the tree as a kermes-oak, and somewhat small if we regard it as an oak. The fruit is smaller in size than that of the kermes-oak, and equal to the smallest acorns; it is sweeter than that of the kermes-oak, bitterer than that of the oak. Some call the fruit of the kermes-oak and of the *aria* 'mast,'⁶ keeping the name 'acorn' for the fruit of the oak. It has a core which is more obvious than in kermes-oak. Such is the character of the 'cork-oak.'

¹ Already described; cf. 3. 4. 2; 3. 17. 1.

² cf. Paus. *Arcadia*, 8. 12.

³ ἄκυλον: cf. Hom. *Od.* 10. 242.

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4 'Η δὲ κόμαρος, ἡ τὸ μεμαίκυλον φέρουσα τὸ ἐδώδιμον, ἔστι μὲν οὐκ ἄγαν μέγα, τὸν δὲ φλοιὸν ἔχει λεπτὸν μὲν παρόμοιον μυρίκη, τὸ δὲ φύλλον μεταξὺ πρίνου καὶ δάφνης. ἀνθεῖ δὲ τοῦ Πυανεψιῶνος· τὰ δὲ ἄνθη πέφυκεν ἀπὸ μιᾶς κρεμάστρας ἐπ' ἄκρων βοτρυδόν· τὴν δὲ μορφὴν ἔκαστον ἔστιν ὅμοιον μύρτῳ προμήκει καὶ τῷ μεγέθει δὲ σχεδὸν τηλικοῦτον· ἄφυλλον δὲ καὶ κοῦλον ὕσπερ ὡὸν ἐκκεκολαμμένον τὸ στόμα δὲ ἀνεῳγμένον· ὅταν δ' ἀπανθήσαν λεπτὸν καὶ ὕσπερ σφόνδυλος περὶ ἄτρακτον ἡ κάρνειος Δωρικός· οὐ δὲ καρπὸς ἐνιαυτῷ πεπαίνεται, ὥσθ' ἄμα συμβαίνει τοῦτον τ' ἔχειν καὶ τὸν ἔτερον ἀνθεῖν.

5 Παρόμοιον δὲ τὸ φύλλον καὶ ἡ ἀνδράχλη ἔχει τῷ κομάρῳ, μέγεθος οὐκ ἄγαν μέγα· τὸν δὲ φλοιὸν λεῖον ἔχει καὶ πειρρηγνύμενον· καρπὸν δ' ἔχει ὅμοιον τῇ κομάρῳ.

6 "Ομοιον δ' ἔστι τούτοις τὸ φύλλον καὶ τὸ τῆς κοκκυγέας· τὸ δὲ δένδρον μικρόν. Ἰδιον δὲ ἔχει τὸ ἐκπαπποῦσθαι τὸν καρπόν· τοῦτο γὰρ οὐδὲ ἐφ' ἐνὸς ἀκηκόαμεν ἄλλου δένδρου. ταῦτα μὲν οὖν κοινότερα πλείστι χώραις καὶ τόποις.

¹ Plin. 15. 98 and 99; Diosc. 1. 122.

² October.

³ ἐκκεκολαμμένον MV, cf. Arist. *H.A.* 6. 3; ἐγκεκολαμμένον U Ald. ⁴ cf. 1. 13. 3.

⁵ κάρνειος, an unknown word, probably corrupt; κίονος Δωρικοῦ conj. Sch., 'drum of a Doric column.' cf. Athen. 5. 39.

ENQUIRY INTO PLANTS, III. xvi. 4-6

¹ The arbutus, which produces the edible fruit called *memaikylon*, is not a very large tree; its bark is thin and like that of the tamarisk, the leaf is between that of the kermes-oak and that of the bay. It blooms in the month Pyanepsion²; the flowers grow in clusters at the end of the boughs from a single attachment; in shape each of them is like an oblong myrtle flower and it is of about the same size; it has no petals, but forms a cup like an empty eggshell,³ and the mouth is open: when the flower drops off, there is a hole⁴ also through the part by which it is attached, and the fallen flower is delicate and like a whorl on a spindle or a Doric *karneios*.⁵ The fruit takes a year to ripen, so that it comes to pass that this and the new flower are on the tree together.

⁶ The andrachne has a leaf like that of the arbutus and is not a very large tree; the bark is smooth⁷ and cracked,⁸ the fruit is like that of the arbutus.

The leaf of the wig-tree⁹ is also like that of the last named tree, but it is a small tree. Peculiar to it is the fact that the fruit passes into down¹⁰: we have not heard of such a thing in any other tree. These trees are found in a good many positions and regions.

⁶ Plin. 13. 120.

⁷ λεῖον conj. Sch.; λευκὸν U Ald. In Pletho's excerpt the passage has λεῖον, and Plin., l.c., evidently read λεῖον.

⁸ περιρρηγνύμενον. Plin., l.c., seems to have read περιπηγνύμενον. cf. 1. 5. 2; 9. 4. 3.

⁹ Plin. 13. 121. κοκκυγέας conj. Sch. after Plin. l.c., cf. Hesych. s.v. κεκκοκυγαμένην; κοκκομηλέας U; κοκκυμηλέας P₂ Ald.

¹⁰ ἐκπαπποῦσθαι: *fructum amittere lanugine* Plin. l.c. cf. 6. 8. 4.

THEOPHRASTUS

XVII. "Ενια δὲ ἴδιωτερα, καθάπερ καὶ ὁ φελλός· γίνεται μὲν ἐν Τυρρηνίᾳ, τὸ δὲ δένδρον ἔστι στελεχώδες μὲν καὶ ὀλιγόκλαδον, εὔμηκες δὲ ἐπιεικῶς καὶ εὐαυξέει· ξύλον ἵσχυρόν τὸν δὲ φλοιὸν παχὺν σφόδρα καὶ καταρρηγύμενον, ὥσπερ ὁ τῆς πίτυος, πλὴν κατὰ μείζω. τὸ δὲ φύλλον ὅμοιον ταῖς μελίαις παχὺ προμηκέστερον· οὐκ ἀείφυλλον ἀλλὰ φυλλοβολοῦν. καρπὸν δὲ [αἰεὶ] φέρει βαλανηρὸν ὅμοιον τῇ ἀρίᾳ. περιαιροῦσι δὲ τὸν φλοιὸν καὶ φασὶ δεῖν πάντα ἀφαιρεῖν, εἰ δὲ μὴ χείρον γίνεται τὸ δένδρον· ἔξαναπληροῦται δὲ πάλιν σχεδὸν ἐν τρισὶν ἔτεσιν.

2 "Ιδιον δὲ καὶ ἡ κολουτέα περὶ Λιπάραν· δένδρον μὲν εὔμεγεθει, τὸν δὲ καρπὸν φέρει ἐν λοβοῖς ἥλικον φακόν, ὃς πιαίνει τὰ πρόβατα θαυμαστῶς. φύεται δὲ ἀπὸ σπέρματος καὶ ἐκ τῆς τῶν προβάτων κόπρου κάλλιστα. ὥρα δὲ τῆς φυτείας ἅμα 'Αρκτούρῳ δυομένῳ· δεῖ δὲ φυτεύειν προβρέχοντας ὅταν ἥδη διαφύηται ἐν τῷ ὕδατι. φύλλον δὲ ἔχει παρόμοιον τήλει. βλαστάνει δὲ τὸ πρώτον μονοφυὲς ἐπὶ ἔτη μάλιστα τρία ἐν οἷς καὶ τὰς βακτηρίας τέμνουσι· δοκοῦσι γάρ εἶναι καλαί· καὶ ἔάν τις κολούσῃ ἀποθνήσκει· καὶ γάρ ἀπαράβλαστόν ἔστιν· εἴτα σχίζεται καὶ ἀποδευδροῦται τῷ τετάρτῳ ἔτει.

¹ Plin. 16. 34.

² Τυρρηνίᾳ conj. R. Const.; πυρρηνίαι UMV; πυρρηνίᾳ Ald.

³ αἰεὶ must be corrupt: probably repeated from ἀείφυλλον.

⁴ βαλανηρὸν conj. Sch.; βαλανήφορον UMVAld.

⁵ ἀρίᾳ conj. R. Const. from G; ἀγρίᾳ P₂MVAld.; ἀγρίαι U.

ENQUIRY INTO PLANTS, III. xvii. 1-2

*Of cork-oak, kolutea, koloitia, and of certain other trees
peculiar to particular localities.*

XVII. ¹ Some however are more local, such as the cork-oak: this occurs in Tyrrhenia²; it is a tree with a distinct trunk and few branches, and is fairly tall and of vigorous growth. The wood is strong, the bark very thick and cracked, like that of the Aleppo pine, save that the cracks are larger. The leaf is like that of the manna-ash, thick and somewhat oblong. The tree is not evergreen but deciduous. It has always³ an acorn-like⁴ fruit like that of the *aria*⁵ (holm-oak). They strip off the bark,⁶ and they say that it should all be removed,⁷ otherwise the tree deteriorates: it is renewed again in about three years.

The *kolutea*⁸ too is a local tree, occurring in the Lipari islands. It is a tree of good size, and bears its fruit, which is as large as a lentil, in pods; this fattens sheep wonderfully. It grows from seed, and also grows very well from sheep-droppings. The time for sowing it is the setting of Arcturus; and one should first soak the seed and sow it when it is already sprouting in the water. It has a leaf like *telis*⁹ (fenugreek). At first it grows for about three years with a single stem, and in this period men cut their walking-sticks from it; for it seems that it makes excellent ones. And, if the top is cut off during this period, it dies, for it makes no side-shoots. After this period it divides, and in the fourth year develops into a tree.

⁶ cf. 1. 5. 2; 4. 15. 1; Plin. 17. 234.

⁷ ἀφαιρεῖν conj. Coraës; διαιρεῖν P₂ Ald.

⁸ cf. 1. 11. 2; 3. 17. 3.

⁹ τήλει conj. R. Const. from G, *faeno graeco*; τίλει UMV; τύλη Ald.

THEOPHRASTUS

3 Ἡ δὲ περὶ τὴν Ἱδην, ἣν καλοῦσι κολοιτίαν,
ἔτερον εἰδός ἐστιν, θαμνοειδὲς δὲ καὶ ὁξώδες καὶ
πολυμάσχαλον, σπάνιον δέ, οὐ πολύ· ἔχει δὲ
φύλλον δαφνοειδὲς πλατυφύλλον δάφνης, πλὴν
στρογγυλώτερον καὶ μεῖζον ὥστ' ὅμοιον φαίνεσθαι
τῷ τῆς πτελέας, προμηκέστερον δέ, τὴν χρόαν
ἐπὶ θάτερα χλοερὸν ὅπισθεν δὲ ἐπιλευκαῖνον, καὶ
πολύϊνον ἐκ τῶν ὅπισθεν ταῖς λεπταῖς ἵστηται
τῆς ράχεως καὶ μεταξὺ τῶν πλευροειδῶν ἀπὸ¹
τῆς μέσης κατατεινουσῶν φλοιὸν δ' οὐ λεῖον
ἀλλ' οἷον τὸν τῆς ἀμπέλου τὸ δὲ ξύλον σκληρὸν
καὶ πυκνόν· ρίζας δὲ ἐπιπολαίους καὶ λεπτὰς
καὶ μανὰς οὐλὰς δ' ἐνίστε, καὶ ξανθὰς σφόδρα.
καρπὸν δὲ οὐκ ἔχειν φασὶν οὐδὲ ἄνθος· τὴν δὲ
κορυνώδη κάχρυν καὶ τοὺς ὀφθαλμοὺς τοὺς παρὰ
τὰ φύλλα λείους σφόδρα καὶ λιπαροὺς καὶ
λευκοὺς τῷ σχήματι δὲ καχρυώδεις· ἀποκοπὲν δὲ
καὶ ἐπικαυθὲν παραφύεται καὶ ἀναβλαστάνει.

4 Ἱδια δὲ καὶ τάδε τὰ περὶ τὴν Ἱδην ἐστίν, οἷον
ἡ τε Ἀλεξάνδρεια καλουμένη δάφνη καὶ συκῆ τις
καὶ ἀμπέλος. τῆς μὲν οὖν δάφνης ἐν τούτῳ τὸ
ἴδιον, ὅτι ἐπιφυλλόκαρπόν ἐστιν, ὥσπερ καὶ ἡ
κεντρομυρρίνη· ἀμφότεραι γὰρ τὸν καρπὸν ἔχ-
ουσιν ἐκ τῆς ράχεως τοῦ φύλλου.

5 Ἡ δὲ συκῆ θαμνώδες μὲν καὶ οὐχ ὑψηλόν,
πάχος δ' ἔχον ὥστε καὶ πηχυαῖον εἶναι τὴν περί-
μετρον· τὸ δὲ ξύλον ἐπεστραμμένον γλίσχρον·
κάτωθεν μὲν λεῖον καὶ ἄνοζον ἄνωθεν δὲ περί-

¹ κολοιτίαν (? κολοιτέαν) U. cf. 1. 11. 2; 3. 17. 2. Which-ever spelling is correct should probably be adopted in all three places. ² cf. 3. 11. 3.

ENQUIRY INTO PLANTS, III. xvii. 3-5

The tree found about Mount Ida, called *koloitia*,¹ is a distinct kind and is shrubby and branching with many boughs; but it is rather rare. It has a leaf like that of the 'broad-leaved' bay,² but rounder and larger, so that it looks like that of the elm, but it is more oblong: the colour on both sides is green, but the base is whitish; in this part it is very fibrous, because of its fine fibres which spring partly from the midrib,³ partly between the ribs⁴ (so to call them) which run out from the midrib. The bark is not smooth but like that of the vine; the wood is hard and close, the roots are shallow slender and spreading, (though sometimes they are compact), and they are very yellow. They say that this shrub has no fruit nor flower, but has its knobby winter-bud and its 'eyes'; these grow alongside of the leaves, and are very smooth glossy and white, and in shape are like a winter-bud. When the tree is cut or burnt down, it grows from the side and springs up again.

There are also three trees peculiar to Mount Ida, the tree called Alexandrian laurel, a sort of fig, and a 'vine' (currant grape). The peculiarity of the laurel is that it bears fruit on its leaves, like the 'prickly myrtle' (butcher's broom): both have their fruit on the midrib of the leaf.

The 'fig'⁵ is shrubby and not tall, but so thick that the stem is a cubit in circumference. The wood is twisted and tough; below it is smooth and unbranched, above it has thick foliage: the colour both

³ ἐκ τε τῆς βαχέως καὶ conj. W.; καὶ ταῖς βίζαις καὶ Ald. cf. 3. 10. 3, and ἐκ τῆς βαχέως below, 3. 17. 4.

⁴ πλευροειδῶν: πλευροειδῶς conj. St.

⁵ See Index. Plin. 15. 68; cf. Athen. 3. 11.

THEOPHRASTUS

κομον· χρῶμα δὲ καὶ φύλλου καὶ φλοιοῦ πελιόν,
τὸ δὲ σχῆμα τῶν φύλλων ὅμοιον τῷ τῆς φιλύρας
καὶ μαλακὸν καὶ πλατὺ καὶ τὸ μέγεθος παρ-
πλήσιον· ἄνθος μεσπιλώδες καὶ ἀνθεῖ ἄμα τῇ
μεσπίλῃ. ὁ δὲ καρπός, ὃν καλοῦσι σῦκον, ἐρυθρὸς
ἡλίκος ἐλάσση πλὴν στρογγυλώτερος, ἐσθιόμενος
δὲ μεσπιλώδης· ρίζας δὲ ἔχει παχείας ὡσάν
συκῆς ἡμέρου καὶ γλίσχρας. ἀσαπὲς δέ ἐστι τὸ
δένδρον καὶ καρδίαν ἔχει στερεὰν οὐκ ἐντεριώνην.

6 'Η δὲ ἄμπελος φύεται μὲν τῆς "Ιδης περὶ τὰς
Φαλάκρας καλουμένας· ἐστι δὲ θαμνώδες ράβ-
δίοις μικροῖς· τείνονται δὲ οἱ κλῶνες ὡς πυγω-
νιαῖοι, πρὸς οὓς ῥᾶγές εἰσιν ἐκ πλαγίου μέλαιναι
τὸ μέγεθος ἡλίκος κύαμος γλυκεῖαι· ἔχουσι δὲ
ἐντὸς γιγαρτώδες τι μαλακόν· φύλλουν στρογγύλουν
ἀσχιδὲς μικρόν.

XVIII. Ἐχει δὲ καὶ τάλλα σχεδὸν ὅρη φύσεις
τινὰς ἴδιας τὰ μὲν δένδρων τὰ δὲ θάμνων τὰ δ'
ἄλλων ὑλημάτων. ἀλλὰ γάρ περὶ μὲν τῆς ἴδιό-
τητος εἴρηται πλεονάκις ὅτι γίνεται καθ'¹ ἐκάστους
τόπους. ἡ δὲ ἐν αὐτοῖς τοῖς ὁμογενέσιν διαφορά,
καθάπερ ἡ τῶν δένδρων καὶ τῶν θάμνων, ὁμοίως
ἐστὶ καὶ τῶν ἄλλων, ὥσπερ εἴρηται, τῶν πλείστων,
ὥσπερ καὶ ράμνουν καὶ παλιούρου καὶ οἴσου [καὶ
οἴτου] καὶ ροῦ καὶ κιττοῦ καὶ βάτου καὶ ἑτέρων
πολλῶν.

¹ Lit. grape-stone.

² I omit ἡ before διαφορά with Sch.

ENQUIRY INTO PLANTS, III. xvii. 5–xviii. 1

of leaf and bark is a dull green, the shape of the leaf is like that of the lime; it is soft and broad, and in size it also corresponds; the flower is like that of the medlar, and the tree blooms at the same time as that tree. The fruit, which they call a 'fig,' is red, and as large as an olive, but it is rounder and is like the medlar in taste; the roots are thick like those of the cultivated fig, and tough. The tree does not rot, and it has a solid heart, instead of ordinary heart-wood.

The 'vine' (currant grape) grows about the place called Phalakrai in the district of Ida; it is shrubby with small twigs; the branches are about a cubit long, and attached to them at the side are black berries, which are the size of a bean and sweet; inside they have a sort of soft stone¹; the leaf is round undivided and small.

Of the differences in various shrubs—buckthorn, withy, Christ's thorn, bramble, sumach, ivy, smilax, [spindle-tree].

XVIII. Most other inmountains too have certain peculiar products, whether trees shrubs or other woody plants. However we have several times remarked as to such peculiarities that they occur in all regions. Moreover the variation² between things of the same kind which we find in trees obtains also among shrubs and most other things, as has been said: for instance, we find it in buckthorn Christ's thorn withy³ sumach ivy bramble and many others.

³ [*καὶ οἵτου*] bracketed by W.; *καὶ ίσον* Ald.; *καὶ ίσον καὶ οἵτου* MVP; *καὶ οἵσον καὶ οἵτου* U. Only *οἵσος* is mentioned in the following descriptions.

THEOPHRASTUS

2 'Ράμνος τε γάρ ἐστιν ἡ μὲν μέλαινα ἡ δὲ λευκή,
καὶ ὁ καρπὸς διάφορος, ἀκανθοφόροι δὲ ἄμφω.

Τοῦ τε οἴσου τὸ μὲν λευκὸν τὸ δὲ μέλαν· καὶ τὸ
ἄνθος ἑκατέρου καὶ ὁ καρπὸς κατὰ λόγον ὁ μὲν
λευκὸς ὁ δὲ μέλας· ἔνιοι δὲ καὶ ὥσπερ ἀνὰ μέσον,
ῶν καὶ τὸ ἄνθος ἐπιπορφυρίζει καὶ οὕτε οἰνωπὸν
οὔτε ἔκλευκόν ἐστιν ὥσπερ τῶν ἑτέρων. ἔχει δὲ
καὶ τὰ φύλλα λεπτότερα καὶ λειότερα καὶ τὰς
ῥάβδους τὸ λευκόν.

3 "Ο τε παλίουρος ἔχει διαφορὰς . . . ἅπαντα δὲ
τάντα καρποφόρα. καὶ ὁ γε παλίουρος ἐν λοβῷ
τινι τὸν καρπὸν ἔχει καθαπερεὶ φύλλῳ, ἐν ὧ τρία
ἡ τέτταρα γίνεται. χρῶνται δ' αὐτῷ πρὸς τὰς
βῆχας οἱ ἰατροὶ κοπτούντες. ἔχει γάρ τινα
γλισχρότητα καὶ λίπος, ὥσπερ τὸ τοῦ λίνου
σπέρμα. φύεται δὲ καὶ ἐπὶ τοῖς ἐφύδροις καὶ ἐν
τοῖς ξηροῖς, ὥσπερ ὁ βάτος. [οὐχ ἡττον δέ ἐστι
τὸ δένδρον πάρυδρον.] φυλλοβόλον δὲ καὶ οὐχ
ώσπερ ἡ ράμνος ἀειφυλλον.

4 "Ετι δὲ καὶ τοῦ βάτου πλείω γένη, μεγίστην δὲ
ἔχοντες διαφορὰν ὅτι ὁ μὲν ὄρθοφυὴς καὶ ὑψος
ἔχων, ὁ δὲ ἐπὶ τῆς γῆς καὶ εὐθὺς κάτω νεύων καὶ
ὅταν συνάπτῃ τῇ γῇ ρίζούμενος πάλιν, δν δὴ
καλοῦσί τινες χαμαιβατον. τὸ δὲ κυνόσβατον
τὸν καρπὸν ὑπέρυθρον ἔχει καὶ παραπλήσιον τῷ
τῆς ρόας· ἐστι δὲ θάμνου καὶ δένδρου μεταξὺ καὶ
παρόμοιον ταῖς ρόαις, τὸ δὲ φύλλον ἀκανθώδες.

¹ cf. 1. 9. 4; 3. 18. 12; C.P. 1. 10. 7.

² Some words are missing, which described various forms
of παλίουρος, alluded to in πάντα ταῦτα (Sch.). cf. 4. 3. 3,
where an African παλίουρος is described.

³ καθαπερεὶ φύλλῳ conj. W., cf. 3. 11. 2; καθάπερ τὸ φύλλον
UMV.

ENQUIRY INTO PLANTS, III. xviii. 2-4

¹ Thus of buckthorn there is the black and the white form, and there is difference in the fruit, though both bear thorns.

Of the withy there is a black and a white form ; the flower and fruit of each respectively correspond in colour to the name ; but some specimens are, as it were, intermediate, the flower being purplish, and neither wine-coloured nor whitish as in the others. The leaves in the white kind are also slenderer and smoother, as also are the branches.

There is variation also in the Christ's thorn . . . ² all these forms are fruit-bearing. Christ's thorn has its fruit in a sort of pod, resembling a leaf,³ which contains three or four seeds. Doctors bruise ⁴ them and use them against coughs ; for they have a certain viscous and oily character, like linseed. The shrub grows in wet and dry places alike, like the bramble.⁵ But it is deciduous, and not evergreen like buckthorn.

Of the bramble again there are several kinds, shewing very great variation ; one is erect and tall, another runs along the ground and from the first bends downwards, and, when it touches the earth, it roots again ; this some call the 'ground bramble.' The 'dog's bramble' (wild rose) has a reddish fruit, like that of the pomegranate⁶ ; and, like the pomegranate, it is intermediate between a shrub and a tree ; but the leaf is spinous.⁷

⁴ κόπτοντες : for the tense cf. 3. 17. 2, προβρέχοντας.

⁵ οὐχ . . . πάρνδρον probably a gloss, W.

⁶ ρόαις UMV (?) Ald.; ροδαῖς conj. Sch. from Plin. 16. 180. Athen. (2. 82) cites the passage with παραπ. τῆς ροΐᾳ. The Schol. on Theocr. 5. 92 seems to have traces of both readings.

⁷ ἀκανθῶδες conj. Sch. from Schol. on Theocr. (see last note), which quotes the passage with ἀκανθῶδες ; ἀγνῶδες UAld.; so also Athen. l.c. Plin. (24. 121) seems to have read ἵχνῶδες (vestigio hominis simile).

THEOPHRASTUS

5 Τῆς δὲ ροῦ τὸ μὲν ἄρρεν τὸ δὲ θῆλυ καλοῦσι τῷ τὸ μὲν ἄκαρπον εἶναι τὸ δὲ κάρπιμον. οὐκ ἔχει δὲ οὐδὲ τὰς ράβδους ὑψηλὰς οὐδὲ παχείας, φύλλον δὲ ὅμοιον πτελέᾳ πλὴν μικρὸν προμηκέστερον καὶ ἐπίδασυ. τῶν δὲ κλωνίων τῶν νέων ἔξισον τὰ φύλλα εἰς δύο, κατ' ἄλληλα δὲ ἐκ τῶν πλαγίων ὥστε στοιχεῖν. βάπτουσι δὲ τούτῳ καὶ οἱ σκυτοδέψαι τὰ δέρματα τὰ λευκά. ἄνθος λευκὸν βοτρυῶδες, τῷ σχήματι δὲ τὸ ὄλοσχερὲς ὅστλιγγας ἔχον ὥσπερ καὶ ὁ βότρυς. ἀπανθήσαντος δὲ ὁ καρπὸς ἄμα τῇ σταφύλῃ ἐρυθραίνεται, καὶ γίνονται οἷον φακοὶ λεπτοὶ συγκείμενοι. βοτρυῶδες δὲ τὸ σχῆμα καὶ τούτων. ἔχει δὲ τὸ φαρμακῶδες τοῦτο ὁ καλεῖται ροῦς ἐν αὐτῷ ὅστῶδες, ὁ καὶ τῆς ροῦ διηττημένης ἔχει πολλάκις· ρίζα δὲ ἐπιπόλαιος καὶ μονοφυὴς ὥστε ἀνακάμπτεσθαι ρᾳδίως ὀλόρριζα· τὸ δὲ ξύλον ἐντεριώνην ἔχει, εὐφθαρτον δὲ καὶ κοπτόμενον. ἐν πᾶσι δὲ γίγνεται τοῖς τόποις, εὐθενεῖ δὲ μάλιστα ἐν τοῖς ἀργιλώδεσι.

6 Πολυειδῆς δὲ ὁ κιττός· καὶ γὰρ ἐπίγειος, ὁ δὲ εἰς ὕψος αἰρόμενος· καὶ τῶν ἐν ὕψει πλείω γένη. τρία δὲ οὖν φαίνεται τὰ μέγιστα ὅ τε λευκὸς καὶ ὁ μέλας καὶ τρίτον ἡ ἔλιξ. εἴδη δὲ καὶ ἐκάστου τούτων πλείω. λευκὸς γὰρ ὁ μὲν τῷ καρπῷ μόνον, ὁ δὲ καὶ τοῖς φύλλοις ἐστί. πάλιν δὲ τῶν λευκοκάρπων μόνον ὁ μὲν ἀδρὸν καὶ πυκνὸν καὶ συνεστηκότα τὸν καρπὸν ἔχει καθαπερεὶ σφαῖραν,

¹ Plin. 13. 55; 24. 91.

² στοιχεῖν: cf. 3. 5. 3; Plin. 13. 55.

³ βοτρυῶδες conj. W.; βοτρυηδόν U; βοτρυδόν Ald.

⁴ ὁ ροῦς masc. cf. Diosc. 1. 108.

ENQUIRY INTO PLANTS, III. xviii. 5-6

¹ Of the sumach they recognise a 'male' and a 'female' form, the former being barren, the latter fruit-bearing. The branches are not lofty nor stout, the leaf is like that of the elm, but small more oblong and hairy. On the young shoots the leaves grow in pairs at equal distances apart, corresponding to each other on the two sides, so that they are in regular rows.² Tanners use this tree for dyeing white leather. The flower is white and grows in clusters; the general form of it, with branchlets, is like that of the grape-bunch; when the flowering is over, the fruit reddens like the grape, and the appearance of it is like small lentils set close together; the form of these too is clustering.³ The fruit contains the drug called by the same name,⁴ which is a bony substance; it is often still found even when the fruit has been put through a sieve. The root is shallow and single, so that these trees are easily bent right over,⁵ root and all. The wood has heart-wood, and it readily perishes and gets worm-eaten.⁶ The tree occurs in all regions, but flourishes most in clayey soils.

⁷ The ivy also has many forms; one kind grows on the ground, another grows tall, and of the tall-growing ivies there are several kinds. However the three most important seem to be the white the black and the *helix*. And of each of these there are several forms. Of the 'white' one is white only in its fruit, another in its leaves also. Again to take only white-fruited sorts, one of these has its fruit well formed close and compact like a ball; and this

⁵ i.e. nearly uprooted by wind.

⁶ κοπτόμενον: cf. 8. 11. 2, 3 and 5.

⁷ Plin. 16. 144-147.

THEOPHRASTUS

δν δὴ καλοῦσί τινες κορυμβίαν, οἱ δ' Ἀθήνησιν
Ἀχαρνικόν. ὁ δὲ ἐλάττων διακεχυμένος ὥσπερ
καὶ ὁ μέλας· ἔχει δὲ καὶ ὁ μέλας διαφορὰς ἀλλ'
οὐχ ὁμοίως φανεράς.

7 Ἡ δὲ ἔλιξ ἐν μεγίσταις διαφοραῖς καὶ γάρ
τοῖς φύλλοις πλεῖστον διαφέρει τῇ τε μικρότητι
καὶ τῷ γωνοειδῇ καὶ εὐρυθμότερα εἶναι· τὰ δὲ τοῦ
κιττοῦ περιφερέστερα καὶ ἀπλᾶ· καὶ τῷ μήκει
τῶν κλημάτων καὶ ἔτι τῷ ἄκαρπος εἶναι. δια-
τείνονται γάρ τινες τῷ μὴ ἀποκιττοῦσθαι τῇ
φύσει τὴν ἔλικα ἀλλὰ τὴν ἐκ τοῦ κιττοῦ τελειου-
μένην. (εὶ δὲ πᾶσα ἀποκιττοῦται, καθάπερ τινές
φασιν, ἡλικίας ἀν εἴη καὶ διαθέσεως οὐκ εἴδους
διαφορά, καθάπερ καὶ τῆς ἀπίου πρὸς τὴν
ἀχράδα.) πλὴν τό γε φύλλον καὶ ταύτης πολὺ
διαφέρει πρὸς τὸν κιττόν. σπάνιον δὲ τοῦτο καὶ
ἐν ὀλίγοις ἐστὶν ὥστε παλαιούμενον μεταβάλλειν,
8 ὥσπερ ἐπὶ τῆς λεύκης καὶ τοῦ κρότωνος. εἴδη
δ' ἐστὶν πλείω τῆς ἔλικος, ὡς μὲν τὰ προφανέ-
στατα καὶ μέγιστα λαβεῖν τρία, ἡ τε χλοερὰ καὶ
ποιώδης ἥπερ καὶ πλείστη, καὶ ἐτέρα ἡ λευκή, καὶ
τρίτη ἡ ποικίλη, ἣν δὴ καλοῦσί τινες Θρακίαν.

¹ cf. Theocr. 11. 46. ² Plin. 16. 145 foll.

³ i.e. is the most 'distinct' of the ivies.

⁴ cf. 1. 10. 1; Diosc. 2. 179.

⁵ i.e. as an explanation of the barrenness of *helix*.

⁶ i.e. and so becomes fertile.

⁷ διατείνονται: cf. C.P. 4. 6. 1. διατ. τῷ . . . apparently
= "insist on the view that," . . . but the dative is strange.
The sentence, which is highly elliptical, is freely emended by
most editors.

ENQUIRY INTO PLANTS, III. xviii. 6-8

kind some call *korymbias*, but the Athenians call it the 'Acharnian' ivy. Another kind is smaller and loose in growth like the black ivy.¹ There are also variations in the black kind, but they are not so well marked.

² The *helix* presents the greatest differences³; the principal difference is in the leaves,⁴ which are small angular and of more graceful proportions, while those of the ivy proper are rounder and simple; there is also difference in the length of the twigs, and further in the fact that this tree is barren. For,⁵ as to the view that the *helix* by natural development turns into the ivy,⁶ some insist⁷ that this is not so, the only true ivy according to these being that which was ivy from the first⁸; (whereas if, as some say, the *helix* invariably⁹ turns into ivy, the difference would be merely one of age and condition, and not of kind, like the difference between the cultivated and the wild pear). However the leaf even of the full-grown *helix* is very different from that of the ivy, and it happens but rarely and in a few specimens that in this plant a change in the leaf occurs as it grows older, as it does in the abele and the castor-oil plant.¹⁰ ¹¹ There are several forms of the *helix*, of which the three most conspicuous and important are the green 'herbaceous' kind (which is the commonest), the white, and the variegated, which some call the 'Thracian' *helix*. Each of these appears to

⁸ i.e. and *helix* being a distinct plant which is always barren.

⁹ πᾶσα conj. Sch.; πᾶς Ald.

¹⁰ Sc. as well as in *ivy*; cf. 1. 10. 1, where this change is said to be characteristic of these three trees. (The rendering attempted of this obscure section is mainly from W.'s note.)

¹¹ Plin. 16. 148 foll.

THEOPHRASTUS

έκάστη δὲ τούτων δοκεῖ διαφέρειν· καὶ γὰρ τῆς χλωόδους ἡ μὲν λεπτοτέρα καὶ ταξιφυλλοτέρα καὶ ἔτι πυκνοφυλλοτέρα, ἡ δὲ ἡττον πάντα ταῦτ' ἔχουσα. καὶ τῆς ποικίλης ἡ μὲν μεῖζον ἡ δὲ ἐλαττον τὸ φύλλον, καὶ τὴν ποικιλίαν διαφέρουσα. ὡσαύτως δὲ καὶ τὰ τῆς λευκῆς τῷ μεγέθει καὶ τῇ χροιᾷ διαφέρουσιν. εὐανξεστάτη δὲ ἡ ποιώδης καὶ ἐπὶ πλεῖστον προϊούσα. φανερὰν δὲ εἶναι φασιν τὴν ἀποκιττουμένην οὐ μόνον τοῖς φύλλοις ὅτι μείζω καὶ πλατύτερα ἔχει ἀλλὰ καὶ τοῖς βλαστοῖς. εὐθὺς γὰρ ὄρθοὺς ἔχει, καὶ οὐχ ὥσπερ ἡ ἔτέρα κατακεκαμμένη, καὶ διὰ τὴν λεπτότητα καὶ διὰ τὸ μῆκος· τῆς δὲ κιττώδους καὶ βραχύτεροι καὶ παχύτεροι. καὶ ὁ κιττὸς ὅταν ἄρχηται σπερμοῦσθαι μετέωρον ἔχει καὶ ὄρθον τὸν βλαστόν.

9 Πολύρριζος μὲν οὖν ἄπας κιττὸς καὶ πυκνόρριζος συνεστραμμένος ταῖς ρίζαις καὶ ξυλώδεσι καὶ παχείαις καὶ οὐκ ἄγαν βαθύρριζος, μάλιστα δὲ ὁ μέλας, καὶ τοῦ λευκοῦ ὁ τραχύτατος καὶ ἀγριώτατος· δι' ὃ καὶ χαλεπὸς παραφύεσθαι πᾶσι τοῖς δένδροις· ἀπόλλυσι γὰρ πάντα καὶ ἀφαναίνει παραιρούμενος τὴν τροφήν. λαμβάνει δὲ μάλιστα πάχος οὗτος καὶ ἀποδευδροῦται καὶ γίνεται αὐτὸς καθ' αὐτὸν κιττοῦ δένδρου. ὡς δὲ ἐπὶ τὸ πλεῖστον εἶναι πρὸς ἔτέρῳ φιλεῖ καὶ ζητεῖ καὶ ὥσπερ 10 ἐπαλλόκαυλόν ἔστιν. ἔχει δὲ εὐθὺς καὶ τῆς

¹ ταξιφυλλοτέρα conj. W. from Plin. 16. 149, *folia in ordinem digesta*; μακροφυλλοτέρα MSS. cf. 1. 10. 8.

² κατακεκαμμένη conj. W.; κατακεκαυμένη U Ald.; κατακεκαμμένους conj. Sch.

³ κιττώδους MSS.; ποώδους conj. St.

⁴ cf. C.P. 1. 16. 4.

present variations; of the green one form is slenderer and has more regular¹ and also closer leaves, the other has all these characteristics in a less degree. Of the variegated kind again one sort has a larger, one a smaller leaf, and the variegation is variable. In like manner the various forms of the white *helix* differ in size and colour. The 'herbaceous' kind is the most vigorous and covers most space. They say that the form which is supposed to turn into ivy is clearly marked not only by its leaves, because they are larger and broader, but also by its shoots; for these are straight from the first, and this form does not bend over² like the other; also because the shoots are slenderer and larger, while those of the ivy-like³ form are shorter and stouter. ⁴The ivy too, when it begins to seed, has its shoots upward-growing and erect.

All ivies have numerous close roots, which are tangled together woody and stout, and do not run very deep; but this is specially true of the black kind and of the roughest and wildest forms of the white. Wherefore it is mischievous to plant this against any tree; for it destroys and starves any tree by withdrawing the moisture. This form also more than the others grows stout and becomes tree-like, and in fact becomes itself an independent ivy tree, though in general it likes and seeks to be⁵ against another tree, and is, as it were, parasitic.⁶ ⁷Moreover from the first it has also this natural

¹ εἰναι conj. W.; αἰει UM; ἀει Ald.

² i.e. depends on another tree; not, of course, in the strict botanical sense. cf. 3. 18. 11. ἐπαλλόκαυλον conj. Seal.; ἐπαυλόκαλον MV Ald. U (with *v* corrected). cf. περι-αλλόκαυλος, 7. 8. 1; C.P. 2. 18. 2.

³ Plin. 16. 152.

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φύσεώς τι τοιοῦτον· ἐκ γὰρ τῶν βλαστῶν ἀφίησιν
ἀεὶ ρίζας ἀνὰ μέσον τῶν φύλλων, αἰσπερ ἐνδύεται
τοῖς δένδροις καὶ τοῖς τειχίοις οἷον ἐξεπίτηδες
πεποιημέναις ὑπὸ τῆς φύσεως· δι’ ὃ καὶ ἐξαιρού-
μενος τὴν ὑγρότητα καὶ ἔλκων ἀφαναίνει, καὶ ἐὰν
ἀποκοπῇ κάτωθεν δύναται διαμένειν καὶ ζῆν.
ἔχει δὲ καὶ ἑτέραν διαφορὰν κατὰ τὸν καρπὸν οὐ
μικράν· ὁ μὲν γὰρ ἐπίγλυκύς ἐστιν ὁ δὲ σφόδρα
πικρὸς καὶ τοῦ λευκοῦ καὶ τοῦ μέλανος· σημεῖον
δ’ ὅτι τὸν μὲν ἐσθίουσιν οἱ ὅρνιθες τὸν δ’ οὐ.
τὰ μὲν οὖν περὶ τὸν κιττὸν οὕτως ᔁχει.

11 Ἡ δὲ σμῖλαξ¹ ἐστι μὲν ἐπαλλόκαυλον, ὁ δὲ
καυλὸς ἀκανθώδης καὶ ὥσπερ ὁρθάκαυθος, τὸ
δὲ φύλλον κιττώδες μικρὸν ἀγώνιον, κατὰ τὴν
μίσχου πρόσφυσιν τυληρόν. Ἰδιον δ’ ὅτι τὴν τε
διὰ μέσου ταύτην ὥσπερ ράχιν λεπτὴν ᔁχει
καὶ τὰς στημονίους διαλήψεις οὐκ ἀπὸ ταύτης,
ὥσπερ τὰ τῶν ἄλλων, ἀλλὰ περὶ αὐτὴν περιφερεῖς
ἡγμένας ἀπὸ τῆς προσφύσεως τοῦ μίσχου τῷ
φύλλῳ. παρὰ δὲ τοῦ καυλοῦ τὰ γόνατα καὶ
παρὰ τὰς διαλείψεις τὰς φυλλικὰς ἐκ τῶν αὐτῶν
μίσχων τοῖς φύλλοις παραπέφυκεν οὐλος λεπτὸς
καὶ ἐλικτός· ἄνθος δὲ λευκὸν καὶ εὐώδεις λείρινον.

¹ σμῖλαξ: ? μῖλαξ W. cf. 1. 10. 5; Plin. 16. 153–155.

² ἐπαλλόκαυλον conj. Sch.; ἐπανλόκαυλον V. cf. 3. 18. 10.

³ καυλὸς conj. R. Const.; καρπὸς UΜV Ald.

⁴ τυληρόν conj. W.; νοτηρόν Ald. U (corrected).

⁵ ταύτην: cf. τὸ θυλακῶδες τοῦτο, 3. 7. 3. Is the pronoun

characteristic, that it regularly puts forth roots from the shoots between the leaves, by means of which it gets a hold of trees and walls, as if these roots were made by nature on purpose. Wherefore also by withdrawing and drinking up the moisture it starves its host, while, if it is cut off below, it is able to survive and live. There are also other not inconsiderable differences in the fruit; both in the white and in the black kind it is in some cases rather sweet, in others extremely bitter; in proof whereof birds eat one but not the other. Such are the facts about ivy.

The smilax¹ is parasitic,² but its stem³ is thorny and has, as it were, straight thorns; the leaf is ivy-like small and without angles, and makes a callus⁴ at the junction with the stalk. A peculiarity of it is its conspicuous⁵ slender midrib, so to call it, which divides it in two; also the fact that the thread-like branchings⁶ do not start from this, as in other leaves, but are carried in circles round it, starting from the junction of the leaflet with the leaf. And at the joints of the stem⁷ and the spaces between the leaves there grows from the same stalk as the leaves a fine spiral tendril.⁸ The flower is white and fragrant like a lily.⁹ The fruit

deictic, referring to an actual specimen shewn in lecture? cf. also 4. 7. 1.

⁶ διαλήψεις Ald.; διαλείψεις UMV. A mistake probably due to διαλείψεις below, where it is right. διάληψις is the Aristotelian word for a 'division.'

⁷ τοῦ καυλοῦ τὰ γύνατα conj. Sch.; τὸν καυλὸν τὸν ἄτονον Ald.

⁸ This must be the meaning of *ἴουλος* here, qualified by ἐλικτός; but elsewhere it = catkin. cf. 3. 5. 5.

⁹ λεπρινὸν conj. R. Const. from Plin. *l.c.* *olente lilyum*; ἡρινόν U Ald.

THEOPHRASTUS

τὸν δὲ καρπὸν ἔχει προσεμφερῆ τῷ στρύχνῳ καὶ τῷ μηλώθρῳ καὶ μάλιστα τῇ καλουμένῃ σταφυλῇ

12 ἀγρίᾳ· κατακρέμαστοι δ' οἱ βότρυες κιττοῦ τρόπον· παρεγγίζει δ' ὁ παραθριγκισμὸς πρὸς τὴν σταφυλήν· ἀπὸ γὰρ ἑνὸς σημείου οἱ μίσχοι οἱ ῥαγικοί. ὁ δὲ καρπὸς ἐρυθρός, ἔχων πυρῆνας τὸ μὲν ἐπὶ πᾶν δύο, ἐν τοῖς μείζοσι τρεῖς ἐν δὲ τοῖς μικροῖς ἕνα· σκληρὸς δ' ὁ πυρὴν εὐ μάλα καὶ τῷ χρώματι μέλας ἔξωθεν. Ἰδιον δὲ τὸ τῶν βοτρύων, ὅτι ἐκ πλαγίων τε τὸν καυλὸν παραθριγκίζουσιν, καὶ κατ' ἄκρον ὁ μέγιστος βότρυς τοῦ καυλοῦ, ὥσπερ ἐπὶ τῆς ῥάμνου καὶ τοῦ βάτου. τοῦτο δὲ δῆλον ὡς καὶ ἀκρόκαρπον καὶ πλαγιόκαρπον.

13 [Τὸ δ' εὐώνυμος καλούμενον δένδρον φύεται μὲν ἄλλοθί τε καὶ τῆς Λέσβου ἐν τῷ ὄρει τῷ Ὄρδυνῳ καλουμένῳ· ἔστι δὲ ἡλίκον ῥόα καὶ τὸ φύλλον ἔχει ῥοῶδες, μεῖζον δὲ ἡ χαμαιδάφνης, καὶ μαλακὸν δὲ ὥσπερ ἡ ῥόα. ἡ δὲ βλάστησις ἄρχεται μὲν αὐτῷ περὶ τὸν Ποσειδεῶνα· ἀνθεῖ δὲ τοῦ ἥρος· τὸ δὲ ἄνθος ὅμοιον τὴν χρόαν τῷ λευκῷ ἵψῃ· ὅζει δὲ δεινὸν ὥσπερ φόνου. ὁ δὲ καρπὸς ἐμφερῆς τὴν μορφὴν μετὰ τοῦ κελύφους τῷ τοῦ σησάμου λοβῷ· ἔνδοθεν δὲ στερεὸν πλὴν διηρημένον κατὰ τὴν τετραστοιχίαν. τοῦτο ἐσθιό-

¹ Presumably σ. δ ἐδώδιμος. See Index.

² παρεγγίζει δ' δ παραθριγκισμὸς I conj., cf. παραθριγκίζουσι below; παρωγγύζει δὲ παραθρινακίζει δὲ ὡς U; παραγγίζει δὲ παραθρηνακίζει δὲ ὡς MV; παραθριγκίζει δὲ ὡς conj. W.

is like the *strychnos*¹ and the *melothon* (bryony), and most of all like the berry which is called the 'wild grape' (bryony). The clusters hang down as in the ivy, but the regular setting² of the berries resembles the grape-cluster more closely; for the stalks which bear the berries start from a single point. The fruit is red, having generally two stones, the larger ones three and the smaller one; the stone is very hard and in colour black outside. A peculiarity of the clusters is that they make a row³ along the sides of the stalk, and the longest cluster is at the end of the stalk, as in the buckthorn and the bramble. It is clear that the fruit is produced both at the end and at the sides.

⁴ The tree called the spindle-tree⁵ grows, among other places, in Lesbos, on the mountain called Ordynnos.⁶ It is as large as the pomegranate and has a leaf like that of that tree, but larger than that of the periwinkle,⁷ and soft, like the pomegranate leaf. It begins to shoot about the month Poseideon,⁸ and flowers in the spring; the flower in colour is like the gilliflower, but it has a horrible smell, like shed blood.⁹ The fruit, with its case, is like the pod of sesame¹⁰; inside it is hard, but it splits easily according to its four divisions. This tree, if eaten

³ παραθριγκίζουσιν conj. Sch.; παραθρυγκίζουσαν U (corrected); παραθρυγγίζουσι M.

⁴ This section down to the word ἀνόχῳ is clearly out of place: εὐάνυμος was not one of the plants proposed for discussion 3. 18. 1. It should come somewhere among the descriptions of trees characteristic of special localities.

⁵ Plin. 13. 118. ⁶ cf. Plin. 5. 140.

⁷ This irrelevant comparison probably indicates confusion in the text, as is shewn also by Pletho's excerpt of part of this section: see Sch.

⁸ January. ⁹ φόνον: cf. 6. 4. 6. ¹⁰ cf. 8. 5. 2.

THEOPHRASTUS

μενον ὑπὸ τῶν προβάτων ἀποκτιννύει, καὶ τὸ φύλλον καὶ ὁ καρπός, καὶ μάλιστα τὰς αἰγας ἐὰν μὴ καθάρσεως τύχῃ. καθαίρεται δὲ ἀνόχῳ.] περὶ μὲν οὖν δένδρων καὶ θάμνων εἴρηται· ἐν δὲ τοῖς ἔξης περὶ τῶν λειπομένων λεκτέον.

by sheep, is fatal¹ to them, both the leaf and the fruit, and it is especially fatal to goats unless they are purged by it; and the purging is effected by diarrhoea.² So we have spoken of trees and shrubs; in what follows we must speak of the plants which remain.

¹ In Pletho's excerpt (see above) this is said of periwinkle.

² i.e. and not by vomiting.

BOOK IV

Δ

Ι. Αἱ μὲν οὖν διαφοραὶ τῶν ὁμογενῶν τεθεώ-
ρηνται πρότερον. ἄπαντα δ' ἐν τοῖς οἰκείοις
τόποις καλλίω γίνεται καὶ μᾶλλον εὔσθενεῖ· καὶ
γὰρ τοῖς ἀγρίοις εἰσὶν ἑκάστοις οἰκεῖοι, καθάπερ
τοῖς ἡμέροις· τὰ μὲν γὰρ φιλεῖ τοὺς ἐφύδρους
καὶ ἐλώδεις, οἷον αἴγειρος λεύκη ἵτεα καὶ ὅλως τὰ
παρὰ τοὺς ποταμοὺς φυόμενα, τὰ δὲ τοὺς εὔσκε-
πεῖς καὶ εὐηλίους, τὰ δὲ μᾶλλον τοὺς παλισκίους.
πεύκη μὲν γὰρ ἐν τοῖς προσείλοις καλλίστη καὶ
μεγίστη, ἐν δὲ τοῖς παλισκίοις ὅλως οὐ φύεται·
ἐλάτη δὲ ἀνάπαλιν ἐν τοῖς παλισκίοις καλλίστη
τοῖς δ' εὐείλοις οὐχ ὁμοίως.

2 Ἐν Ἀρκαδίᾳ γοῦν περὶ τὴν Κράνην καλου-
μένην τόπος ἐστί τις κοῖλος καὶ ἄπνους, εἰς ὃν
οὐδέποθ' ὅλως ἥλιον ἐμβάλλειν φασίν· ἐν τούτῳ
δὲ πολὺ διαφέρουσιν αἱ ἐλάται καὶ τῷ μήκει καὶ
τῷ πάχει, οὐ μὴν ὁμοίως γε πυκναὶ οὐδὲ ὡραῖαι
ἀλλ' ἥκιστα, καθάπερ καὶ αἱ πεῦκαι αἱ ἐν τοῖς
παλισκίοις· δι' ὃ καὶ πρὸς τὰ πολυτελῆ τῶν
ἔργων, οἷον θυρώματα καὶ εἴ τι ἄλλο σπουδαῖον,
οὐ χρῶνται τούτοις ἀλλὰ πρὸς τὰς ναυπηγίας
μᾶλλον καὶ τὰς οἰκοδομάς· καὶ γὰρ δοκοὶ κάλλι-

BOOK IV

OF THE TREES AND PLANTS SPECIAL TO PARTICULAR DISTRICTS AND POSITIONS.

Of the importance of position and climate.

I. THE differences between trees of the same kind have already been considered. Now all grow fairer and are more vigorous in their proper positions ; for wild, no less than cultivated trees, have each their own positions : some love wet and marshy ground, as black poplar abele willow, and in general those that grow by rivers ; some love exposed¹ and sunny positions ; some prefer a shady place. The fir is fairest and tallest in a sunny position, and does not grow at all in a shady one ; the silver-fir on the contrary is fairest in a shady place, and not so vigorous in a sunny one.

Thus there is in Arcadia near the place called Krane a low-lying district sheltered from wind, into which they say that the sun never strikes ; and in this district the silver-firs excel greatly in height and stoutness, though they have not such close grain nor such comely wood, but quite the reverse,—like the fir when it grows in a shady place. Wherefore men do not use these for expensive work, such as doors or other choice articles, but rather for ship-building and house-building. For excellent

¹ *εὐσκεπτεῖς* should mean 'sheltered,' but cannot in this context, nor in *C.P.* 1. 13. 11 and 12: the word seems to have been confused with *εὐσκοπος*.

THEOPHRASTUS

σται καὶ τανεῖαι καὶ κέραιαι αἱ ἐκ τούτων, ἔτι δὲ
ιστοὶ τῷ μήκει διαφέροντες ἀλλ᾽ οὐχ ὁμοίως
ἰσχυροί· καὶ ἐκ τῶν προσείλων ἀμα τῇ βραχύτητι
πυκνότεροί τε ἐκείνων καὶ ἰσχυρότεροι γίνονται.

3 Χαίρει δὲ σφόδρα καὶ ἡ μίλος τοῖς παλισκίοις
καὶ ἡ πάδος καὶ ἡ θραύπαλος. περὶ δὲ τὰς
κορυφὰς τῶν ὄρέων καὶ τοὺς ψυχροὺς τόπους θυία
μὲν φύεται καὶ εἰς ὑψος, ἐλάτη δὲ καὶ ἄρκευθος
φύεται μὲν οὐκ εἰς ὑψος δέ, καθάπερ καὶ περὶ τὴν
ἄκραν Κυλλήνην· φύεται δὲ καὶ ἡ κήλαστρος
ἐπὶ τῶν ἄκρων καὶ χειμεριωτάτων. ταῦτα μὲν
οὖν ἀν τις θείη φιλόψυχρα· τὰ δὲ ἄλλα πάντα
ώς εἰπεῖν [οὐ] μᾶλλον χαίρει τοῖς προσείλοις.
οὐ μὴν ἄλλὰ καὶ τοῦτο συμβαίνει κατὰ τὴν
χώραν τὴν οἰκείαν ἐκάστω τῶν δένδρων. ἐν
Κρήτῃ γοῦν φασιν ἐν τοῖς Ἰδαίοις ὅρεσι καὶ ἐν τοῖς
Λευκοῖς καλουμένοις ἐπὶ τῶν ἄκρων ὅθεν οὐδέποτε
ἐπιλείπει χιῶν κυπάριστον εἶναι· πλείστη γὰρ
αὕτη τῆς ὑλης καὶ ὄλως ἐν τῇ νήσῳ καὶ ἐν τοῖς
ὅρεσιν.

4 Ἔστι δέ, ὥσπερ καὶ πρότερον εἴρηται, καὶ τῶν
ἀγρίων καὶ τῶν ἡμέρων τὰ μὲν ὄρεινά τὰ δὲ
πεδεινὰ μᾶλλον. ἀναλογίᾳ δὲ καὶ ἐν αὐτοῖς τοῖς
ὅρεσι τὰ μὲν ἐν τοῖς ὑποκάτω τὰ δὲ περὶ τὰς
κορυφάς, ὥστε καὶ καλλίω γίνεται καὶ εὔσθενη.
πανταχοῦ δὲ καὶ πάσης τῆς ὑλης πρὸς βορρᾶν
τὰ ἔνδια πυκνότερα καὶ οὐλότερα καὶ ἀπλῶς
καλλίω· καὶ ὄλως δὲ πλείω ἐν τοῖς προσβορείοις
φύεται. αὐξάνεται δὲ καὶ ἐπιδίδωσι τὰ πυκνὰ

¹ I omit *αἱ* before *κέραιαι* with P.

² ἀμα I conj.; ἄλλα Ald.; om. W. after Sch.; ἄλλ' ἀμα conj. St.

ENQUIRY INTO PLANTS, IV. I. 2-4

rafters beams and yard-arms¹ are made from these, and also masts of great length which are not however equally strong ; while masts made of trees grown in a sunny place are necessarily² short but of closer grain and stronger than the others.

Yew *pados* and joint-fir rejoice exceedingly in shade. On mountain tops and in cold positions odorous cedar grows even to a height, while silver-fir and Phoenician cedar grow, but not to a height,—for instance on the top of Mount Cyllene ; and holly also grows in high and very wintry positions. These trees then we may reckon as cold-loving ; all others, one may say in general, prefer a sunny position. However this too depends partly on the soil appropriate to each tree ; thus they say that in Crete on the mountains of Ida and on those called the White Mountains the cypress is found on the peaks whence the snow never disappears ; for this is the principal tree both in the island generally and in the mountains.

Again, as has been said³ already, both of wild and of cultivated trees some belong more to the mountains, some to the plains. And on the mountains themselves in proportion to the height some grow fairer⁴ and more vigorous in the lower regions, some about the peaks. However it is true of all trees anywhere that with a north aspect the wood is closer and more compact⁵ and better generally ; and, generally speaking, more trees grow in positions facing the north. Again trees which are close

³ 3. 2. 4.

⁴ Something seems to have dropped out before ζετε.

⁵ οὐλότερα conj. W. from mutilated word in U ; καλλιώτερα MV ; καλλίω Ald.

THEOPHRASTUS

μὲν ὅντα μᾶλλον εἰς μῆκος, δι’ ὃ καὶ ἄνοξα καὶ εὐθέα καὶ ὁρθοφυῆ γίνεται, καὶ κωπεῶνες ἐκ τούτων κάλλιστοι· <τὰ δὲ μανὰ> μᾶλλον εἰς βάθος καὶ πάχος, δι’ ὃ καὶ σκολιώτερα καὶ ὁζωδέστερα καὶ τὸ ὅλον στερεώτερα καὶ πυκνότερα φύεται.

5 Σχεδὸν δὲ τὰς αὐτὰς ἔχει διαφορὰς τούτοις καὶ ἐν τοῖς παλισκίοις καὶ ἐν τοῖς εὐείλοις καὶ ἐν τοῖς ἀπνόοις καὶ εὐπνόοις· ὁζωδέστερα γάρ καὶ βραχύτερα καὶ ἡττον εὐθέα τὰ ἐν τοῖς εὐείλοις ἢ τοῖς προσηνέμοις. ὅτι δὲ ἔκαστον ζητεῖ καὶ χώραν οἰκείαν καὶ κράσιν ἀέρος φανερὸν τῷ τὰ μὲν φέρειν ἐνίους τόπους τὰ δὲ μὴ φέρειν μήτε αὐτὰ γυγνόμενα μήτε φυτευόμενα ῥᾳδίως, ἐὰν δὲ καὶ ἀντιλάβηται μὴ καρποφορεῖν, ὥσπερ ἐπὶ τοῦ φοίνικος ἐλέχθη καὶ τῆς Αἰγυπτίας συκαμίνου καὶ ἄλλων εἰσὶ γάρ πλείω καὶ ἐν πλείσι χώραις τὰ μὲν δλως οὐ φυόμενα τὰ δὲ φυόμενα μὲν ἀναυξῆ δὲ καὶ ἄκαρπα καὶ τὸ ὅλον φαῦλα. περὶ ὧν ἵσως λεκτέον ἐφ’ ὅσον ἔχομεν ἰστορίας.

II. Ἐν Αἰγύπτῳ γάρ ἐστιν ἴδια δένδρα πλείω, ἢ τε συκάμινος καὶ ἡ περσέα καλουμένη καὶ ἡ βάλανος καὶ ἡ ἄκανθα καὶ ἔτερ’ ἄττα.

Ἐστι δὲ ἡ μὲν συκάμινος παραπλησία πως τῇ ἐνταῦθα συκαμίνῳ· καὶ γάρ τὸ φύλλον παρόμοιον

¹ κωπεῶνες: cf. 5. 1. 7. ² τὰ δὲ μανὰ add. W.

³ cf. 5. 1. 8.

⁴ 2. 2. 10.

⁵ δλως . . . μὲν conj. W.; δλως οὐ φυτευόμενα U; δλως φυτευόμενα MVP Ald.

together grow and increase more in height, and so become unbranched straight and erect, and the best oar-spars¹ are made from these, while those that grow far apart² are of greater bulk and denser habit³; wherefore they grow less straight and with more branches, and in general have harder wood and a closer grain.

Such trees exhibit nearly the same differences, whether the position be shady or sunny, windless or windy; for trees growing in a sunny or windy position are more branched shorter and less straight. Further that each tree seeks an appropriate position and climate is plain from the fact that some districts bear some trees but not others; (the latter do not grow there of their own accord, nor can they easily be made to grow), and that, even if they obtain a hold, they do not bear fruit—as was said⁴ of the date-palm the sycamore and others; for there are many trees which in many places either do not grow at all, or⁵ if they do, do not thrive nor bear fruit, but are in general of inferior quality. And perhaps we should discuss this matter, so far as our enquiries go.

Of the trees special to Egypt, and of the carob.

II. ⁶ Thus in Egypt there are a number of trees which are peculiar⁷ to that country, the sycamore the tree called *persea* the *balanos* the acacia and some others.

Now the sycamore to a certain extent resembles the tree which bears that name⁸ in our country; its

⁶ Plin. 13. 56 and 57.

⁷ ἀπίστη conj. R. Const.; ἔντιa Ald.

⁸ i.e. mulberry. See Index.

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ἔχει καὶ τὸ μέγεθος καὶ τὴν ὅλην πρόσοψιν, τὸν δὲ καρπὸν ἴδιως φέρει παρὰ τὰ ἄλλα, καθάπερ ἐλέχθη καὶ ἐν τοῖς ἐξ ἀρχῆς· οὐ γάρ ἀπὸ τῶν βλαστῶν οὐδέν ἀπὸ τῶν ἀκρεμόνων ἀλλ’ ἐκ τοῦ στελέχους, μέγεθος μὲν ἡλίκου σῦκον καὶ τῇ ὅψει δὲ παραπλήσιον, τῷ χυλῷ δὲ καὶ τῇ γλυκύτητι τοῖς ὀλύνθοις, πλὴν γλυκύτερον πολὺ καὶ κευχραμίδας ὅλως οὐκ ἔχοντα, πλήθει δὲ πολύν. καὶ πέττειν οὐ δύναται μὴ ἐπικνισθέντα· ἀλλ’ ἔχοντες ὄνυχας σιδηροῦς ἐπικνίζουσιν· ἀ δ’ ἀν ἐπικνισθῆ τεταρταῖα πέττεται· τούτων δ’ ἀφαιρεθέντων πάλιν ἄλλα φύεται καὶ ἄλλα καὶ ἐκ τοῦ αὐτοῦ τόπου μηδὲν παραλλάττοντα· καὶ τούθ’ οἱ μὲν τρὶς οἱ δὲ πλεονάκις φασὶ γίνεσθαι.

2 πολύοπον δὲ τὸ δένδρον σφόδρα ἔστι καὶ τὸ ξύλον αὐτοῦ εἰς πολλὰ χρήσιμον. ἴδιον δὲ ἔχει δοκεῖ παρὰ τάλλα· τμηθὲν γάρ εὐθὺς χλωρόν ἔστι· αὐάινεται δὲ ἐμβύθιον· εἰς βόθρον δὲ ἐμβάλλουσι καὶ εἰς τὰς λίμνας εὐθὺς καὶ ταριχεύουσι· βρεχόμενον δ’ ἐν τῷ βυθῷ ξηραίνεται· καὶ ὅταν τελέως ξηρὸν γένηται, τότε ἀναφέρεται καὶ ἐπινεῖ καὶ δοκεῖ τότε καλῶς τεταριχεῦσθαι· γίνεται γάρ κοῦφον καὶ μανόν. ἡ μὲν οὖν συκάμινος ἔχει ταύτας τὰς ἴδιότητας.

3 "Εοικε δέ τις παραπλησία ἡ φύσις είναι καὶ τῆς ἐν Κρήτῃ καλουμένης Κυπρίας συκῆς· καὶ γάρ ἐκείνη φέρει τὸν καρπὸν ἐκ τοῦ στελέχους καὶ ἐκ τῶν παχυτάτων ἀκρεμόνων, πλὴν ὅτι βλαστόν τινα ἀφίησι μικρὸν ἀφυλλον ὕσπερ ρίζουν, πρὸς ὃ γε ὁ καρπός. τὸ δὲ στέλεχος μέγα

¹ 1. 1. 7; cf. 1. 14 2.

² cf. C.P. 1. 17. 9; Diosc. 1. 127; Athen. 2. 36. This

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leaf is similar, its size, and its general appearance ; but it bears its fruit in a quite peculiar manner, as was said at the very outset¹ ; it is borne not on the shoots or branches, but on the stem ; in size it is as large as a fig, which it resembles also in appearance, but in flavour and sweetness it is like the 'immature figs,' except that it is much sweeter and contains absolutely no seeds, and it is produced in large numbers. It cannot ripen unless it is scraped ; but they scrape it with iron 'claws'² ; the fruits thus scraped ripen in four days. If these are removed, others and others again grow from exactly the same point, and this some say occurs three times over, others say it can happen more times than that. Again the tree is very full of sap, and its wood is useful for many purposes. There is another peculiar property which it appears to possess ; when it is cut, it is at first green, but it dries in deep water³ ; they put it at once in a hole or in pools and so season it ; and it becomes dry by being soaked in the deep water, and when it is completely dry, it is fetched up and floats and is then thought to be duly seasoned ; for it is now light and porous. Such are the peculiarities of the sycamore.

Somewhat similar appears to be the character of the tree which in Crete is called the 'Cyprian fig'⁴ (sycamore). For this also bears its fruit on the stem and on the thickest branches ; but in this case there is a small leafless shoot, like a root, to which the fruit is attached. The stem is large and like the

scraping was the prophet Amos' occupation : cf. Amos 7. 14. comm.

¹ έμβεθον conj. W.; εἰς βέθον UMVP Ald. ? ἐν βέθη δν.

² See Index. cf. Athen. 3. 11; Plin. 13. 58; Diosc. 1. 127. 3.

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καὶ παρόμοιον τῇ λεύκῃ, φύλλον δὲ τῇ πτελέᾳ. πεπαίνει δὲ τέτταρας καρπούς, ὅσαιπερ αὐτοῦ καὶ αἱ βλαστήσεις οὐδένα δὲ πεπαίνει μὴ ἐπιτμηθέντος τοῦ ἐρινοῦ καὶ ἐκρυέντος τοῦ ὅποῦ. ἡ δὲ γλυκύτης προσεμφερής τῷ σύκῳ καὶ τὰ ἔσωθεν τοῖς ἐρινοῖς· μέγεθος ἡλίκον κοκκύμηλον.

4 (Ταύτη δὲ παραπλησία καὶ ἡν οἱ "Ιωνες κερωνίαν καλοῦσιν· ἐκ τοῦ στελέχους γὰρ καὶ αὗτη φέρει τὸν πλεῖστον καρπόν, ἀπὸ δὲ τῶν ἀκρεμόνων, ὥσπερ εἴπομεν, ὀλίγον. ὁ δὲ καρπὸς ἔλλοβος, διν καλοῦσί τινες Αἴγυπτιον σῦκον διημαρτηκότες· οὐ γίνεται γὰρ ὅλως περὶ Αἴγυπτον ἀλλ' ἐν Συρίᾳ καὶ ἐν Ἰωνίᾳ δὲ καὶ περὶ Κυνίδον καὶ Ρόδου. ἀείφυλλον δὲ καὶ ἄνθος ἔκλευκον ἔχον καὶ τι βαρύτητος, μὴ μετεωρίζον δὲ σφόδρα καὶ δλως ἐκ τῶν κάτω παραβλαστητικὸν ἄνωθεν δὲ ὑποξηραινόμενον. ἔχει δὲ ἄμα καὶ τὸν ἔνον καὶ τὸν νέον καρπόν· ἀφαιρουμένου γὰρ θατέρου μετὰ Κύνα καὶ ὁ ἔτερος εὐθὺς φανερὸς κυούμενος· κύνεται γὰρ ὥσπερ βότρυς ὁμοσχήμων· εἰτ' αὐξηθεὶς ἄνθει περὶ Αρκτοῦν καὶ ισημερίαν· ἀπὸ τούτου δὴ διαμένει τὸν χειμῶνα μέχρι Κυνός. ἡ μὲν οὖν ὁμοιοτης ὅτι στελεχόκαρπα καὶ ταῦτα· διαφορὰ δὲ αἱ εἰρημέναι πρὸς τὴν συκάμινον.)

5 'Ἐν Αἴγυπτῳ δὲ ἐστὶν ἔτερον ἡ περσέα καλούμενον, τῇ μὲν προσόψει μέγα καὶ καλόν, παραπλήσιον δὲ μάλιστα τῇ ἀπίῳ καὶ φύλλοις καὶ ἄνθεσι καὶ ἀκρεμόσι καὶ τῷ ὅλῳ σχήματι· πλὴν

¹ δσαιπερ conj. R. Const., etc., cf. Athen. l.c.; δσα ὑπὲρ αὐτοῦ U (corrected); δσα ὑπὲρ αὐτὸν M; δσα ὑπὲρ αὐτοῦ Ald.

² Plin. 13. 59. ³ 1. 14. 2.

abele, but the leaf is like that of the elm. It ripens its fruit four times a year, having also¹ four periods of growth ; but it ripens no fruit unless the 'fig' is split and the juice let out. The sweet taste resembles that of the fig, and the inside of the fruit is like that of wild figs : it is as large as a plum.

² (Like this too is the tree which the Ionians call carob ; for this too bears most of its fruit on the stem, though it bears a little also on the branches, as we said.³ The fruit is in a pod ; some call it the 'Egyptian fig'—erroneously ; for it does not occur at all in Egypt, but in Syria and Ionia and also in Cnidos and Rhodes. It is evergreen and has a whitish flower and is somewhat acrid ; it does not attain to a great height, and it sends out side-shoots entirely from its lower parts, while it withers above. It has on it at the same time both last year's fruit and the new fruit ; for if the one is removed after the rising of the dog-star, immediately the other is seen swelling up ; for there swells⁴ up as it were another similar cluster. This then increases and flowers about the rising of Arcturus and the equinox ; and thenceforward it⁵ persists through the winter to the rising of the dog-star. The likeness then consists in the fact that these trees too bear fruit on their stems, and the differences between them and the sycamore are as has been said.)

⁶ In Egypt there is another tree called the *persca*, which in appearance is large and fair, and it most resembles the pear in leaves flowers branches and general form, but it is evergreen, while the other is

¹ κύεται conj. W. from G ; κύει MSS.

² i.e. the cluster, now in the fruit stage.

³ Plin. 13. 60 and 61.

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τὸ μὲν ἀείφυλλον τὸ δὲ φυλλοβόλον. καρπὸν δὲ φέρει πολὺν καὶ πᾶσαν ὥραν· περικαταλαμβάνει γὰρ ὁ νέος ἀεὶ τὸν ἔνον· πέττει δὲ ὑπὸ τοὺς ἐτησίας· τὸν δ' ἄλλον ὡμότερον ἀφαιροῦσι καὶ ἀποτιθέασιν. ἔστι δὲ τὸ μέγεθος ἡλίκον ἄπιος, τῷ σχήματι δὲ πρόμακρος ἀμυγδαλώδης, χρῶμα δὲ αὐτοῦ ποιῶδες. ἔχει δὲ ἐντὸς κάρυον, ὥσπερ τὸ κοκκύμηλον, πλὴν ἔλαττον πολὺ καὶ μαλακώτερον· τὴν δὲ σάρκα γλυκεῖαν σφόδρα καὶ ἡδεῖαν καὶ εὔπεπτον· οὐδὲν γὰρ ἐνοχλεῖ πολὺ προσενεγκαμένων. εὔριξον δὲ τὸ δένδρον καὶ μήκει καὶ πάχει καὶ πλήθει πολύ· ἔχει δὲ καὶ ἔνδον ἰσχυρὸν καὶ καλὸν τῇ ὅψει μέλαν, ὥσπερ ὁ λωτός, ἐξ οὐ καὶ τὰ ἀγάλματα καὶ τὰ κλινία καὶ τραπέζια καὶ τάλλα τὰ τοιαῦτα ποιοῦσιν.

6 Ἡ δὲ βάλανος ἔχει μὲν τὴν προσηγορίαν ἀπὸ τοῦ καρποῦ· φύλλον δ' αὐτῇ παραπλήσιον τῷ τῆς μυρρίνης πλὴν προμηκέστερον. ἔστι δὲ τὸ δένδρον εὐπαχὲς μὲν καὶ εὐμέγεθες, οὐκ εὐφυὲς δὲ ἄλλα παρεστραμμένουν. τοῦ καρποῦ δὲ τοῖς κελύφεσι χρῶνται οἱ μυρεφοὶ κόπτοντες· εὐώδες γὰρ ἔχει τὸν δὲ καρπὸν αὐτὸν ἀχρεῖον. ἔστι δὲ καὶ τῷ μεγέθει καὶ τῇ ὅψει παραπλήσιος τῷ τῆς καππάριος· ἔνδον δὲ ἰσχυρὸν καὶ εἰς ἄλλα τε χρήσιμον καὶ εἰς τὰς ναυπηγίας.

7 Τὸ δὲ καλούμενον κουκιόφορόν ἔστιν ὄμοιον τῷ φοίνικι· τὴν δὲ ὄμοιότητα κατὰ τὸ στέλεχος ἔχει καὶ τὰ φύλλα· διαφέρει δὲ ὅτι ὁ μὲν φοίνιξ μονοφυὲς καὶ ἀπλοῦν ἔστι, τοῦτο δὲ προσανξηθὲν σχίζεται καὶ γίνεται δίκρουν, εἴτα πάλιν ἐκάτερον

¹ ἀποτιθέασιν conj. R. Const. from G (recondunt); τιθέασι UMV Ald.

deciduous. It bears abundant fruit and at every season, for the new fruit always overtakes that of last year. It ripens its fruit at the season of the etesian winds: the other fruit they gather somewhat unripe and store¹ it. In size it is as large as a pear, but in shape it is oblong, almond-shaped, and its colour is grass-green. It has inside a stone like the plum, but much smaller and softer; the flesh is sweet and luscious and easily digested; for it does no hurt if one eats it in quantity. The tree has good roots as to length thickness and number. Moreover its wood is strong and fair in appearance, black like the nettle-tree: out of it men make their images beds tables and other such things.

² The *balanos* gets its name from its fruit³; its leaf is like that of the myrtle⁴ but it is longer. The tree is of a good stoutness⁵ and stature, but not of a good shape, being crooked. The perfumers use the husks of the fruit, which they bruise; for this is fragrant, though the fruit itself is useless. In size and appearance it is like the fruit of the caper; the wood is strong and useful for shipbuilding and other purposes.

⁶ The tree called the doum-palm is like the date-palm; the resemblance is in the stem and the leaves, but it differs in that the date-palm is a tree with a single undivided stem, while the other, as it increases, splits and becomes forked,⁷ and then each of the two

² Plin. 13. 61.

³ i.e. it is like an acorn (*θάλανος*).

⁴ *μυρρίνης* MVP Ald.; *μυρίκης* U.

⁵ *εὐπαχὴς* conj. Sch.; *εὐπαθὴς* U; *ἀπαθὴς* Ald. H.

⁶ Plin. 13. 62.

⁷ cf. 2. 6. 9, where the same tree is evidently indicated.
δίκρουν conj. Salm., Scal., etc.; *ἄκρον* U Ald. H.

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τούτων ὁμοίως· ἔτι δὲ τὰς ράβδους βραχείας ἔχει σφόδρα καὶ οὐ πολλάς. χρῶνται δὲ τῷ φύλλῳ, καθάπερ τῷ φοίνικι, πρὸς τὰ πλέγματα. καρπὸν δὲ ἵδιον ἔχει πολὺ διαφέροντα καὶ μεγέθει καὶ σχήματι καὶ χυλῷ· μέγεθος μὲν γὰρ ἔχει σχεδὸν χειροπληθές· στρογγύλον δὲ καὶ οὐ προμήκη· χρῶμα ἐπίξανθον· χυλὸν δὲ γλυκὺν καὶ εὔστομον· οὐκ ἀθρόον δέ, ὥσπερ ὁ φοίνιξ, ἀλλὰ κεχωρισμένου καθ' ἓνα· πυρῆνα δὲ μέγαν καὶ σφόδρα σκληρόν, ἔξ οὐ τοὺς κρίκους τορνεύουσι τοὺς εἰς τοὺς στρωματεῖς τοὺς διαποικίλους· διαφέρει δὲ πολὺ τὸ ξύλον τοῦ φοίνικος· τὸ μὲν γὰρ μανὸν καὶ ἴνῳδες καὶ χαῦνον, τὸ δὲ πυκνὸν καὶ βαρὺ καὶ σαρκώδες καὶ διατηθὲν οὐλὸν σφόδρα καὶ σκληρόν ἔστιν. καὶ οὕτω γε δὴ Πέρσαι πάνυ ἐτίμων αὐτὸν καὶ ἐκ τούτου τῶν κλινῶν ἐποιοῦντο τοὺς πόδας.

8 Ἡ δὲ ἄκανθα καλεῖται μὲν διὰ τὸ ἄκανθῶδες ὅλον τὸ δένδρον εἶναι πλὴν τοῦ στελέχους· καὶ γὰρ ἐπὶ τῶν ἀκρεμόνων καὶ ἐπὶ τῶν βλαστῶν καὶ ἐπὶ τῶν φύλλων ἔχει. μεγέθει δὲ μέγα, καὶ γὰρ δωδεκάπτηχυς ἔξ αὐτῆς ἐρέψιμος ὅλη τέμνεται. διττὸν δὲ τὸ γένος αὐτῆς, ἡ μὲν γάρ ἔστι λευκὴ ἡ δὲ μέλαινα· καὶ ἡ μὲν λευκὴ ἀσθενής τε καὶ εὔσηπτος· ἡ δὲ μέλαινα ἵσχυροτέρα τε καὶ ἄσηπτος, δι' ὃ καὶ ἐν ταῖς ναυπηγίαις χρῶνται πρὸς τὰ ἐγκοίλια αὐτῆς. τὸ δένδρον δὲ οὐκ ἄγαν ὄρθοφυές. ὁ δὲ καρπὸς ἔλλοβος, καθάπερ τῶν χειδροπῶν, φύλλῳ χρῶνται οἱ ἐγχώριοι πρὸς τὰ δέρματα ἀντὶ κηκίδος. τὸ δ' ἄνθος καὶ τῇ ὅψει καλόν, ὥστε καὶ στεφάνους ποιεῖν ἔξ αὐτοῦ, καὶ φαρμα-

branches forks again: moreover the twigs are very short and not numerous. They use the leaf, like the palm-leaf, for plaiting. It has a peculiar fruit, very different from that of the date-palm in size form and taste; for in size it is nearly big enough to fill the hand, but it is round rather than long; the colour is yellowish, the flavour sweet and palatable. It does not grow bunched together, like the fruit of the date-palm, but each fruit grows separately; it has a large and very hard stone, out of which they turn the rings for embroidered bed-hangings.¹ The wood is very different to that of the date-palm; whereas the latter is of loose texture fibrous and porous,² that of the doum-palm is close heavy and fleshy, and when split is exceedingly compact and hard. The Persians³ used to esteem it highly and made the feet of their couches out of it.

⁴ The *akantha* (acacia) is so called because the whole tree is spinous (*akanthodes*) except the stem; for it has spines on the branches shoots and leaves. It is of large stature, since lengths of timber for roofing of twelve cubits are cut from it. There are two kinds, the white and the black; the white is weak and easily decays, the black is stronger and less liable to decay; wherefore they use it in shipbuilding for the ribs.⁵ The tree is not very erect in growth. The fruit is in a pod, like that of leguminous plants, and the natives use it for tanning hides instead of gall. ⁶ The flower is very beautiful in appearance, so that they make garlands of it, and it has medicinal

¹ Plin. *l.c.*, *velares annulos*; cf. Athen. 12. 71, *ad fin.*

² χαῦνος conj. Sch.; χλωρὸν Ald.

³ i.e. during their occupation of Egypt.

⁴ Plin. 13. 63; Athen. 15. 25.

⁵ cf. Hdt. 2. 96. ⁶ cf. Athen. *l.c.*

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κῶδες, δι' ὁ καὶ συλλέγουσιν οἱ ἰατροί. γίνεται δὲ ἐκ ταύτης καὶ τὸ κόμμι¹ καὶ ὁσεὶ καὶ πληγείσης καὶ αὐτόματον ἄνευ σχάσεως. ὅταν δὲ κοπῆ, μετὰ τρίτον ἔτος εὐθὺς ἀναβεβλάστηκε· πολὺ δὲ τὸ δένδρον ἔστι, καὶ δρυμὸς μέγας περὶ τὸν Θηβαϊκὸν νόμον, οὐπερ καὶ ἡ δρῦς καὶ ἡ περσέα πλείστη καὶ ἡ ἐλάα.

9 Καὶ γὰρ ἡ ἐλάα περὶ τοῦτον τὸν τόπον ἔστι, τῷ ποταμῷ μὲν οὐκ ἀρδευομένη, πλείω γὰρ ἡ τριακόσια στάδια ἀπέχει, ναματιαίοις δὲ ὕδασιν εἰσὶ γὰρ κρῆναι πολλαί. τὸ δὲ ἐλαιον οὐδὲν χείρον τοῦ ἐνθάδε, πλὴν κακωδέστερον διὰ τὸ σπανίοις τοῖς ἀλσὶ χρῆσθαι· φύσει δὲ τὸ ξύλον τοῦ δένδρου καὶ σκληρὸν καὶ παραπλήσιον τεμνόμενον τὴν χρόαν τῷ λωτίνῳ.

10 Ἀλλο δέ τι δένδρον ἡ κοκκυμηλέα, μέγα μὲν τῷ μεγέθει καὶ τὴν φύσιν τοῦ καρποῦ ὅμοιον τοῖς μεσπίλοις, καὶ τὸ μέγεθος παραπλήσιον πλὴν ἔχοντα πυρῆνα στρογγύλον· ἀρχεται δὲ ἀνθεῖν μηνὸς Πυανεψιῶνος, τὸν δὲ καρπὸν πεπαίνει περὶ ἥλιον τροπὰς χειμερινάς· ἀείφυλλον δὲ ἔστιν. οἱ δὲ περὶ τὴν Θηβαΐδα κατοικοῦντες διὰ τὴν ἀφθονίαν τοῦ δένδρου ξηραίνουσι τὸν καρπὸν καὶ τὸν πυρῆνα ἔξαιροῦντες κόπτουσι καὶ ποιοῦσι παλάθας.

11 Ἡ τλημα δὲ ἵδιόν τι φύεται περὶ Μέμφιν, οὐ κατὰ φύλλα καὶ βλαστοὺς καὶ τὴν ὅλην μορφὴν

¹ cf. Hdt. l.c.

² σχάσεως conj. R. Const.; σχίσεως Ald.

³ πλείστη conj. R. Const.; πλεκτὴ UMVAld.

⁴ cf. C.P. 6. 8. 7, where this olive is said to produce no oil.

⁵ cf. Strabo, 17. 1. 35.

properties, wherefore physicians gather it.¹ Gum is also produced from it, which flows both when the tree is wounded and also of its own accord without any incision² being made. When the tree is cut down, after the third year it immediately shoots up again; it is a common tree, and there is a great wood of it in the Thebaid, where grow the oak, the *persea* in great abundance,³ and the olive.

⁴ For the olive also grows in that district, though it is not watered by the river, being more than 300 furlongs distant from it, but by brooks; for there are many springs. The oil produced is not inferior to that of our country, except that it has a less pleasing smell,⁵ because it has not a sufficient natural supply of salt.⁶ The wood of the tree is hard in character, and, when split, is like in colour⁷ to that of the nettle-tree.

⁸ There is another tree, the (Egyptian) plum (sebesten), which is of great stature, and the character of its fruit⁹ is like the medlar (which it resembles in size), except that it has a round stone. It begins to flower in the month Pyanepsion,¹⁰ and ripens its fruit about the winter solstice, and it is evergreen.¹¹ The inhabitants of the Thebaid, because of the abundance of the tree, dry the fruit; they take out the stones, bruise it, and make cakes of it.

There is a peculiar bush¹² which grows about Memphis, whose peculiarity does not lie in its leaves

⁶ σπανίους . . . φύσει conj. W.; σπανίως τοῖς ἀλσὶ χρ. τῇ φύσει Ald.; so U, but omitting τῇ.

⁷ i.e. black. cf. 4. 3. 1. ⁸ Plin. 13. 64 and 65.

⁹ τοῦ καρποῦ add. Scal. from G and Plin. l.c. ¹⁰ October.

¹¹ ἀειφύλλον conj. Scal. from G and Plin. l.c.; φύλλον U M V Ald.

¹² *Mimosa asperata*; see Index, App. (2). οὐλημα conj. Scal. from G (materia); οὐδημα M Ald. U (corrected).

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ἔχον τὸ ἴδιον ἀλλ' εἰς τὸ συμβαῖνον περὶ αὐτὸν πάθος· ἡ μὲν γὰρ πρόσοψις ἀκανθώδης ἐστὶν αὐτοῦ, καὶ τὸ φύλλον παρόμοιον ταῖς πτερίσιν· ὅταν δέ τις ἄψηται τῶν κλωνίων, ὥσπερ ἀφαναινόμενα τὰ φύλλα συμπίπτειν φασὶν εἶτα μετά τινα χρόνον ἀναβιώσκεσθαι πάλιν καὶ θάλλειν. καὶ τὰ μὲν ἴδια τῆς χώρας, ὅσα γ' ἀν δένδρα τις ἡ θάμνους εἴποι, τὰ γ' ἐπιφανέστατα ταῦτ' ἐστί. περὶ γὰρ τῶν ἐν τῷ ποταμῷ καὶ τοῖς ἔλεσιν ὑστερον ἐροῦμεν, ὅταν καὶ περὶ τῶν ἄλλων ἐνύδρων.

12 [Ἄπαντα δὲ ἐν τῇ χώρᾳ τὰ δένδρα τὰ τοιαῦτα μεγάλα καὶ τοῖς μήκεσι καὶ τοῖς πάχεσιν· ἐν γοῦν Μέμφιδι τηλικοῦτο δένδρον εἶναι λέγεται τὸ πάχος, δι τρεῖς ἄνδρες οὐ δύνανται περιλαμβάνειν. ἔστι δὲ καὶ τμηθὲν τὸ ξύλον καλόν· πυκνόν τε γὰρ σφόδρα καὶ τῷ χρώματι λωτοειδές.]

III. Ἐν Λιβύῃ δὲ ὁ λωτὸς πλεῖστος καὶ κάλλιστος καὶ ὁ παλίουρος καὶ ἐν τισι μέρεσι τῇ τε Νασαμωνικῇ καὶ παρ' Ἀμμωνι καὶ ἄλλοις ὁ φοῖνιξ· ἐν δὲ τῇ Κυρηναίᾳ κυπάρισσος καὶ ἐλάαι τε κάλλισται καὶ ἔλαιον πλεῖστον. ἴδιώτατον δὲ πάντων τὸ σίλφιον· ἔτι κρόκον πολὺν ἡ χώρα φέρει καὶ εὔσμον. ἔστι δὲ τοῦ λωτοῦ τὸ μὲν ὅλον δένδρον ἴδιον εύμεγεθες ἡλίκον ἄπιος ἡ μικρὸν ἔλαττον· φύλλον δὲ ἐντομὰς ἔχον καὶ πρινώδεις· τὸ μὲν ξύλον μέλαν· γένη δὲ αὐτοῦ πλείω διαφορὰς ἔχοντα τοῖς καρποῖς· ὁ δὲ καρπὸς

¹ πάθος: cf. 1. 1. 1 n.

² cf. Schol. ad Nic. Ther. 683 of a sensitive plant called σκορπίουρος or ἴσχύουσα. ἀφαναινόμενα conj. Scal.; ἀφανλινόμενα UMVP₂Ald.

ENQUIRY INTO PLANTS, IV. II. II-III. I

shoots and general form, but in the strange property¹ which belongs to it. Its appearance is spinous and the leaf is like ferns, but, when one touches the twigs, they say that the leaves as it were wither up² and collapse and then after a time come to life again and flourish. Such are the most conspicuous things peculiar to the country, to speak only of trees or shrubs. For we will speak later of the things which grow in the river and the marshes, when we come to speak of the other water plants.

³ All the trees of this kind in that country are large, both in height and stoutness; thus at Memphis there is said to be a tree of such girth that three men cannot embrace it. The wood too, when split, is good, being of extremely close grain and in colour like the nettle-tree.

Of the trees and shrubs special to Libya.

III. ⁴ In Libya the *lotos* is most abundant and fairest; so also is the Christ's thorn, and in some parts, such as the Nasamonian district and near the temple of Zeus Ammon, the date-palm. In the Cyrenaica the cypress grows and the olives are fairest and the oil most abundant. Most special of all to this district is the silphium, and the land also bears abundant fragrant saffron-crocus. As to the *lotos*—the whole tree is peculiar, of good stature, as tall as a pear-tree, or nearly so; the leaf is divided and like that of the kermes-oak, and the wood is black. There are several sorts, which differ in their fruits; the fruit

³ This section is evidently out of place; its probable place is at the end of § 10, so that the description will belong to the 'Egyptian plum.'

⁴ See Index. Plin. 13. 104-106.

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ἡλίκος κύαμος, πεπαίνεται δέ, ὥσπερ οἱ βότρυες, μεταβάλλων τὰς χροιάς· φύεται δέ, καθάπερ τὰ μύρτα, παρ' ἄλληλα πυκνὸς ἐπὶ τῶν βλαστῶν· ἐσθιόμενος δ' ὁ ἐν τοῖς Λωτοφάγοις καλουμένοις γλυκὺς καὶ ἡδὺς καὶ ἀσινὴς καὶ ἔτι πρὸς τὴν κοιλίαν ἀγαθός· ἡδίων δ' ὁ ἀπύρηνος, ἔστι γὰρ καὶ τοιοῦτον τι γένος· ποιοῦσι δὲ καὶ οἰνον ἔξ αὐτοῦ.

2 Πολὺ δὲ τὸ δένδρον καὶ πολύκαρπον· τό γ' οὖν Ὁφέλλου στρατόπεδον, ἡνίκα ἐβάδιζεν εἰς Καρχηδόνα, καὶ τούτῳ φασὶ τραφῆναι πλείους ἡμέρας ἐπιλιπόντων τῶν ἐπιτηδειῶν. ἔστι μὲν οὖν καὶ ἐν τῇ νήσῳ τῇ Λωτοφαγιτίδι καλουμένη πολύς· αὕτη δ' ἐπίκειται καὶ ἀπέχει μικρόν· οὐ μὴν οὐθέν γε μέρος ἀλλὰ πολλῷ πλείου ἐν τῇ ἡπείρῳ· πλεῖστον γὰρ ὅλως ἐν τῇ Λιβύῃ, καθάπερ εἴρηται, τούτο καὶ ὁ παλίουρος ἔστιν· ἐν γὰρ Εὔεσπερίσι τούτοις καυσίμοις χρῶνται. διαφέρει δὲ οὗτος ὁ λωτὸς τοῦ παρὰ τοῖς Λωτοφάγοις.

3 Ὁ δὲ παλίουρος θαμνωδέστερος τοῦ λωτοῦ· φύλλον δὲ παρόμοιον ἔχει τῷ ἐνταῦθα, τὸν δὲ καρπὸν διάφορον· οὐ γὰρ πλατὺν ἀλλὰ στρογγύλον καὶ ἐρυθρόν, μέγεθος δὲ ἡλίκον τῆς κέδρου ἡ μικρῷ μεῖζον· πυρῆνα δὲ ἔχει οὐ συνεσθιόμενον καθάπερ ταῖς ῥοαῖς· ἡδὺν δὲ τὸν καρπὸν· καὶ ἐάν τις οἶνον ἐπιχέῃ καὶ αὐτὸν ἡδίω γίνεσθαι φασὶ καὶ τὸν οἶνον ἡδίω ποιεῖν.

¹ cf. Hdt. 4. 177; Athen. 14. 651; Scyl. *Peripl. Lotophagi*.

² A ruler of Cyrene, who invaded Carthaginian territory in conjunction with Agathocles, B.C. 308.

³ τῇ λωτοφαγιτίδι conj. W.; τῇ Λωτοφαγίᾳ Φάριδι UMAld.

⁴ μέρος: μείων conj. Sch. (*non minor* G.).

ENQUIRY INTO PLANTS, IV. III. 1-3

is as large as a bean, and in ripening like grapes it changes its colour: it grows, like myrtle-berries, close together on the shoots; to eat, that which grows among the people called the Lotus-eaters¹ is sweet pleasant and harmless, and even good for the stomach; but that which has no stone is pleasanter (for there is also such a sort), and they also make wine from it.

The tree is abundant and produces much fruit; thus the army of Ophellas,² when it was marching on Carthage, was fed, they say, on this alone for several days, when the provisions ran short. It is abundant also in the island called the island of the Lotus-eaters;³ this lies off the mainland at no great distance: it grows however in no less quantity,⁴ but even more abundantly⁵ on the mainland; for, as has been said,⁶ this tree is common in Libya generally as well as the Christ's thorn; for in the islands called Euesperides⁷ they use these trees as fuel. However this *lotos*⁸ differs from that found in the land of the Lotus-eaters.

⁹ The (Egyptian) 'Christ's thorn' is more shrubby than the *lotos*; it has a leaf like the tree of the same name of our country, but the fruit is different; for it is not flat, but round and red, and in size as large as the fruit of the prickly cedar or a little larger; it has a stone which is not eaten with the fruit, as in the case of the pomegranate, but the fruit is sweet, and, if one pours wine over it, they say that it becomes sweeter and that it makes the wine sweeter.

⁵ πλεῖον U; ? πλεῖων with MV.

⁶ 4. 3. 1. ⁷ cf. Hdt. 4. 191.

⁸ cf. Hdt. 2. 96.

⁹ See Index. Plin. 13. 111.

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4 ⁵Ἐνιοι δὲ τὸ τοῦ λωτοῦ δένδρον θαμνῶδες εἶναι καὶ πολύκλαδον, τῷ στελέχει δὲ εὐπαχές· τὸν δὲ καρπὸν μέγα τὸ κάρυον ἔχειν· τὸ δὲ ἐκτὸς οὐ σαρκῶδες ἀλλὰ δερματωδέστερον· ἐσθιόμενον δὲ οὐχ οὕτω γλυκὺν ὡς εὔστομον· καὶ τὸν οἶνον δν ἐξ αὐτοῦ ποιοῦσιν οὐ διαμένειν ἀλλ’ ἡ δύο ἡ τρεῖς ἡμέρας εἰτ’ ὀξύνειν. ἡδίω μὲν οὖν τὸν καρπὸν τὸν ἐν τοῖς Λωτοφάγοις, ξύλον δὲ κάλλιον τὸ ἐν Κυρηναίᾳ· θερμοτέραν δὲ εἶναι τὴν χώραν τὴν τῶν Λωτοφαγῶν· τοῦ ξύλου δὲ τὴν ρίζαν εἶναι μελαντέραν μὲν πολὺ πυκνὴν δὲ ἡττον· καὶ εἰς ἐλάττω χρησίμην· εἰς γὰρ τὰ ἐγχειρίδια καὶ τὰ ἐπικολλήματα χρῆσθαι, τῷ ξύλῳ δὲ εἰς τε τοὺς αὐλοὺς καὶ εἰς ἄλλα πλείω.

5 Ἐν δὲ τῇ μὴ ὑομένῃ τῆς Λιβύης ἄλλα τε πλείω φύεσθαι καὶ φοίνικας μεγάλους καὶ καλούς· οὐ μὴν ἀλλ’ ὅπου μὲν φοῖνιξ ἀλμυρίδα τε εἶναι καὶ ἔφυδρον τὸν τόπον, οὐκ ἐν πολλῷ δὲ βάθει ἀλλὰ μάλιστα ἐπ’ ὄργυίαις τρισίν. τὸ δὲ ὑδωρ ἔνθα μὲν γλυκὺ σφόδρα ἔνθα δὲ ἀλυκὸν πλησίον ὅιτων ἀλλήλοις· ὅπου δὲ τὰ ἄλλα φύεται ξηρὸν καὶ ἄνυδρον· ἐνιαχοῦ δὲ καὶ τὰ φρέατα εἶναι ἑκατὸν ὄργυιῶν, ὥστε ὑποξυγίοις ἀπὸ τροχηλιᾶς ἀνιμᾶν· δι’ δὲ καὶ θαυμαστὸν πῶς ποτε ὠρυχθῇ τηλικαῦτα βάθη· τὸ δὲ οὖν τῶν ὑδάτων τῶν ὑπὸ τοὺς φοίνικας καὶ ἐν Ἀμμωνος εἶναι διαφορὰν ἔχον τὴν εἰρημένην. φύεσθαι δὲ ἐν τῇ μὴ ὑομένῃ τὸ θύμον πολὺ καὶ ἄλλα ἴδιά τε καὶ πλείω γίνεσθαι

¹ Sch. after Scal. places this section before § 3, making the account of this tree consecutive. ² Plin. 13. 17. 104–106.

³ εὐπαχές conj. R. Const.; εὐσταχές U; εὐσταχες MP₂ Ald.

⁴ cf. Hdt. 2. 96.

ENQUIRY INTO PLANTS, IV. III. 4-5

¹ Some say that the *lotos*² is shrubby and much branched, though it has a stout³ stem; and that the stone in the fruit is large, while the outside is not fleshy but somewhat leathery; and that to eat it is not so much sweet as palatable; and that the wine which they make out of it does not keep more than two or three days, after which it gets sour; and so that the fruit⁴ found in the Lotus-eaters' country is sweeter, while the wood in the Cyrenaica is better; and that the country of the Lotus-eaters is hotter; and that the root is much blacker than the wood, but of less close grain, and of use for fewer purposes; for they use it only for dagger-handles and tessellated work,⁵ while the wood is used for pipes and many other things.

In the part of Libya where no rain falls they say that, besides many other trees, there grow tall and fine date-palms; however they add that, where the date-palm is found, the soil⁶ is salt and contains water, and that at no great depth, not more than three fathoms. They say also that the water is in some places quite sweet, but in others quite close by it is brackish; that where however other things grow, the soil is dry and waterless; and that in places even the wells are a hundred fathoms deep, so that they draw water by means of a windlass worked by beasts. Wherefore it is wonderful how at any time digging to such depths was carried out. Such, they say, is the special character of the water supply which feeds the date-palms in the district also of the temple of Zeus Ammon. Further it is said that in the land where no rain falls thyme⁷ is

⁵ ἐπικολλήματα: lit. 'pieces glued on'; cf. Plin. *l.c.*

⁶ cf. Hdt. 3. 183.

⁷ θύμον mBas. H.; θάμνον UMVALd. cf. 6. 2. 3.

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ένταῦθα, καὶ πτῶκα καὶ δορκάδα καὶ στρουθὸν
6 καὶ ἔτερα τῶν θηρίων. ἀλλὰ ταῦτα μὲν ἄδηλον
εἰ ἐκτοπίζει που πιόμενα· (διὰ γὰρ τὸ τάχος
δύναται μακράν τε καὶ ταχὺ παραγενέσθαι),
ἄλλως τε κεὶ δι' ἡμερῶν τινων πίνουσι, καθάπερ
καὶ τὰ ἡμερα παρὰ τρίτην ἡ τετάρτην ποτίζεται
ταῦτα· τὸ δὲ τῶν ἄλλων ζώων, οἷον ὅφεων
σαυρῶν καὶ τῶν τοιούτων, φανερὸν ὅτι ἄποτα.
τοὺς δὲ Λίβυας λέγειν ὅτι τὸν δνον ἐσθίει ταῦτα
δις καὶ παρ' ἡμῖν γίνεται, πολύπουν τε καὶ μέλαν
συσπειρώμενον εἰς ἑαυτό· τοῦτον δὲ πολύν τε
γίνεσθαι σφόδρα καὶ ὑγρὸν τὴν φύσιν εἶναι.

7 Δρόσον δὲ ἀεὶ πίπτειν ἐν τῇ μὴ ὑομένῃ πολλήν,
ῶστε δῆλον ὅτι τὸν μὲν φοίνικα καὶ εἴ τι ἄλλο
φύεται ἐν ἀνύδροις τό τε ἐκ τῆς γῆς ἀνιὸν ἐκτρέφει
καὶ πρὸς τούτῳ ἡ δρόσος. ἵκανὴ γὰρ ὡς κατὰ
μεγέθη καὶ τὴν φύσιν αὐτῶν ἔηρὰν οὐσαν καὶ ἐκ
τοιούτων συνεστηκῦναν. καὶ δένδρα μὲν ταῦτα
πλεῖστα καὶ ἴδιωτατα. περὶ δὲ τοῦ σιλφίου
λεκτέον ὑστερον ποιόν τι τὴν φύσιν.

IV. Ἐν δὲ τῇ Ἀσίᾳ παρ' ἐκάστοις ἵδι¹ ἄττα
τυγχάνει· τὰ μὲν γὰρ φέρουσιν αἱ χῶραι τὰ δ'²

¹ *Lepus Aegyptiacus.* cf. Arist. *H.A.* 8. 28.

² ὡς κατὰ conj. Scal. from G; ὡστε τὰ Ald.H.

abundant, and that there are various other peculiar plants there, and that there are found the hare¹ gazelle ostrich and other animals. However it is uncertain whether these do not migrate in order to find drink somewhere, (for by reason of their fleetness they are able to appear at a distant place in a short space of time), especially if they can go for several days without drinking, even as these animals, when domesticated, are only given drink every third or fourth day. While as to other animals, such as snakes lizards and the like, it is plain that they go without drink. And we are told that according to the Libyans, these animals eat the wood-louse, which is of the same kind that is found also in our country, being black, with many feet, and rolling itself into a ball ; this, they say, is extremely common and is juicy by nature.

They say also that dew always falls abundantly in the land in which no rain falls, so that it is plain that the date-palms, as well as anything else which grows in waterless places, is kept alive by the moisture which rises from the ground, and also by the dew. For the latter is sufficient, considering² the size of such trees and their natural character, which is dry and formed of dry components. And trees of that character are most abundant in, and most specially belong to such country. The character of the silphium we must discuss later.

Of the trees and herbs special to Asia.

IV. In different parts of Asia also there are special trees, for the soil of the various regions produces some but not others. ³Thus they say that

¹ Plin. 16. 144.

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οὐ φύουσιν· οἶον κιττὸν καὶ ἐλάαν οὐ φασιν εἶναι τῆς Ἀσίας ἐν τοῖς ἄνω τῆς Συρίας ἀπὸ θαλάττης πένθ' ἡμερῶν· ἀλλ' ἐν Ἰνδοῖς φανῆναι κιττὸν ἐν τῷ ὅρει τῷ Μηρῷ καλουμένῳ, ὅθεν δὴ καὶ τὸν Διόνυσον εἶναι μυθολογοῦσι. δι' ὁ καὶ Ἀλέξανδρος ἀπ' ἔξοδίας λέγεται ἀπιῶν ἐστεφανωμένος κιττῷ εἶναι καὶ αὐτὸς καὶ ἡ στρατιά· τῶν δὲ ἄλλων ἐν Μηδίᾳ μόνον περικλείειν γὰρ αὕτη δοκεῖ καὶ συνάπτειν πως τῷ Πόντῳ. καίτοι γε διεφιλοτιμήθη Ἀρπαλος ἐν τοῖς παραδείσοις τοῖς περὶ Βαβυλῶνα φυτεύων πολλάκις καὶ πραγματευόμενος, ἀλλ' οὐδὲν ἐποίει πλέον· οὐ γὰρ ἐδύνατο ζῆν ὥσπερ τάλλα τὰ ἐκ τῆς Ἑλλάδος. τοῦτο μὲν οὖν οὐ δέχεται ἡ χώρα διὰ τὴν τοῦ ἀέρος κράσιν· ἀναγκαίως δὲ δέχεται καὶ πύξιν καὶ φίλυραν· καὶ γὰρ περὶ ταῦτα πονοῦσιν οἱ ἐν τοῖς παραδείσοις. ἔτερα δὲ ἵδια φέρει καὶ δένδρα **2** καὶ ὑλήματα· καὶ ἔοικεν ὅλως ὁ τόπος ὁ πρὸς ἀνατολὰς καὶ μεσημβρίαν ὥσπερ καὶ ζῶα καὶ φυτὰ φέρειν ἵδια παρὰ τοὺς ἄλλους· οἶον ἡ τε Μηδία χώρα καὶ Περσὶς ἄλλα τε ἔχει πλείω καὶ τὸ μῆλον τὸ Μηδικὸν ἡ τὸ Περσικὸν καλούμενον. ἔχει δὲ τὸ δένδρον τοῦτο φύλλον μὲν ὅμοιον καὶ σχεδὸν ἵσον τῷ τῆς ἀνδράχλης, ἀκάνθας δὲ οἵας ἀπιος ἡ ὀξυάκανθος, λειας δὲ καὶ ὀξείας σφόδρα καὶ ἴσχυράς· τὸ δὲ μῆλον οὐκ ἐσθίεται μέν,

¹ ἐλάαν conj. Spr.; ἐλάτην MSS. cf. Hdt. 1. 193; Xen. *Anab.* 4. 4. 13; Arr. *Ind.* 40.

² κιττὸν conj. W., cf. Arr. *Anab.* 5. 1. 6; καὶ τὴν UMV; καὶ τῷ Ald. H. ³ λέγεται add. W.

⁴ ἔξοδιας UMVP; Ἰνδιας W. with Ald.

⁵ κιττῷ εἶναι conj. W.; εἴτα μεῖναι U; εἴτα μὴ εἶναι MVP Ald.

ENQUIRY INTO PLANTS, IV. IV. 1-2

ivy and olive¹ do not grow in Asia in the parts of Syria which are five days' journey from the sea ; but that in India ivy² appears on the mountain called Meros, whence, according to the tale, Dionysus came. Wherefore it is said³ that Alexander, when he came back from an expedition,⁴ was crowned with ivy,⁵ himself and his army. But elsewhere in Asia it is said to grow only in Media, for that country seems in a way to surround and join on to the Euxine Sea.⁶ However,⁷ when Harpalus took great pains over and over again to plant it in the gardens of Babylon, and made a special point of it, he failed: since it could not live like the other things introduced from Hellas. The country then does not⁸ admit this plant on account of the climate, and it grudgingly admits the box and the lime; for even these give much trouble to those engaged in the gardens. It also produces some peculiar trees and shrubs. And in general the lands of the East and South appear to have peculiar plants, as they have peculiar animals; for instance, Media and Persia have, among many others, that which is called the 'Median' or 'Persian apple' (citron).⁹ This tree¹⁰ has a leaf like to and almost identical with that of the andrachne, but it has thorns like those of the pear¹¹ or white-thorn, which however are smooth and very sharp and strong. The 'apple' is not

⁶ i.e. and so Greek plants may be expected to grow there. But the text is probably defective; cf. the citation of this passage, Plut. *Quaest. Conv.* 3. 2. 1.

⁷ κατροι γε. This sentence does not connect properly with the preceding. ⁸ οὐ add. Sch.

⁹ Plin. 12. 15 and 16; cited also Athen. 3. 26.

¹⁰ cf. Verg. *G.* 2. 131-135.

¹¹ ἄπιος: ? here=ἄχραδος R. Const. cf. *C.P.* 1. 15. 2.

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εῦσοσμον δὲ πάνυ καὶ τὸ φύλλον τοῦ δένδρου· κάνεις ἴματια τεθῆ τὸ μῆλον ἄκοπα διατηρεῖ. χρήσιμον δ’ ἐπειδὰν τύχη *<τις>* πεπωκὼς φάρμακον *<θανάσιμον· δοθὲν γὰρ ἐν οἴνῳ διακόπτει τὴν κοιλίαν καὶ ἔξαγει τὸ φάρμακον>* καὶ πρὸς στόματος εὐωδίαν· ἐὰν γάρ τις ἐψήσῃ ἐν ζωμῷ, ἡ ἐν ἄλλῳ τινὶ τὸ ἔσωθεν τοῦ μῆλου ἐκπιέσῃ εἰς τὸ στόμα καὶ καταροφήσῃ, ποιεῖ τὴν ὀσμὴν ἡδεῖαν.

3 σπείρεται δὲ τοῦ ἥρος εἰς πρασιὰς ἔξαιρεθὲν τὸ σπέρμα διειργασμένας ἐπιμελῶς, είτα ἀρδεύεται διὰ τετάρτης ἡ πέμπτης ἡμέρας· ὅταν δὲ ἀδρὸν ἡ, διαφυτεύεται πάλιν τοῦ ἔαρος εἰς χωρίον μαλακὸν καὶ ἔφυδρον καὶ οὐ λίαν λεπτόν· φιλεῖ γάρ τὰ τοιαῦτα. φέρει δὲ τὰ μῆλα πᾶσαν ὥραν· τὰ μὲν γάρ ἀφήρηται τὰ δὲ ἀνθεῖ τὰ δὲ ἐκπέττει. τῶν δὲ ἀνθῶν ὅσα, ὥσπερ εἴπομεν, ἔχει καθάπερ ἡλακάτην ἐκ μέσου τιν' ἔξέχουσαν, ταῦτα ἔστι γόνιμα, ὅσα δὲ μὴ ἄγονα. σπείρεται δὲ καὶ εἰς ὅστρακα διατετρημένα, καθάπερ καὶ οἱ φοίνικες. τοῦτο μὲν οὖν, ὥσπερ εἴρηται, περὶ τὴν Περσίδα καὶ τὴν Μηδίαν ἔστιν.

4 Ἡ δὲ Ἰνδικὴ χώρα τήν τε καλουμένην ἔχει συκῆν, ἡ καθίησιν ἐκ τῶν κλάδων τὰς ρίζας ἀν’ ἔκαστον ἔτος, ὥσπερ εἴρηται πρότερον· ἀφίησι δὲ οὐκ ἐκ τῶν νέων ἀλλ’ ἐκ τῶν ἔνων καὶ ἔτι παλαιοτέρων· αὗται δὲ συνάπτουσαι τῇ γῇ ποιοῦσιν ὥσπερ δρύφακτον κύκλῳ περὶ τὸ δένδρον, ὥστε γίνεσθαι καθάπερ σκηνήν, οὐ δὴ καὶ

¹ *τις* add. W. from Athen. *l.c.*; *θανάσιμον . . . φάρμακον* add. Sch. from Athen. *l.c.* ² Plin. 11. 278; 12. 16.

³ ἀδρὸν ἢ W. from Athen. *l.c.*, whence διαφυτεύεται W. etc. for διαφυτεύηται Ald. H. ἀδρόν τι UMVAld.

ENQUIRY INTO PLANTS, IV. IV. 2-4

eaten, but it is very fragrant, as also is the leaf of the tree. And if the 'apple' is placed among clothes, it keeps them from being moth-eaten. It is also useful when one¹ has drunk deadly poison; for being given in wine it upsets the stomach and brings up the poison; also for producing sweetness of breath;² for, if one boils the inner part of the 'apple' in a sauce, or squeezes it into the mouth in some other medium, and then inhales it, it makes the breath sweet. The seed is taken from the fruit and sown in spring in carefully tilled beds, and is then watered every fourth or fifth day. And, when it is growing vigorously,³ it is transplanted, also in spring, to a soft well-watered place, where the soil is not too fine; for such places it loves. And it bears its 'apples' at all seasons; for when some have been gathered, the flower of others is on the tree and it is ripening others. Of the flowers, as we have said,⁴ those which have, as it were, a distaff⁵ projecting in the middle are fertile, while those that have it not are infertile. It is also sown, like date-palms, in pots⁶ with a hole in them. This tree, as has been said, grows in Persia and Media.

⁷ The Indian land has its so-called 'fig-tree' (banyan), which drops its roots from its branches every year, as has been said above⁸; and it drops them, not from the new branches, but from those of last year or even from older ones; these take hold of the earth and make, as it were, a fence about the tree, so that it becomes like a tent, in

⁴ 1. 13. 4. ⁵ i.e. the pistil.

⁶ Plin. 12. 16, *fictilibus in vasis, dato per cavernas radicibus spiramento*: the object, as Plin. explains, was to export it for medical use.

⁷ Plin. 12. 22 and 23.

⁸ 1. 7. 3.

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εἰώθασι διατρίβειν. εἰσὶ δὲ αἱ ρίζαι φυόμεναι διάδηλοι πρὸς τοὺς βλαστούς· λευκότεραι γὰρ καὶ δασεῖαι καὶ σκολιαὶ καὶ ἄφυλλοι. ἔχει δὲ καὶ τὴν ἄνω κόμην πολλήν, καὶ τὸ ὅλον δένδρον εὔκυκλον καὶ τῷ μεγέθει μέγα σφόδρα· καὶ γὰρ ἐπὶ δύο στάδια ποιεῖν φασὶ τὴν σκιάν· καὶ τὸ πάχος τοῦ στελέχους ἔνια πλειόνων ἡ ἔξήκοντα βημάτων, τὰ δὲ πολλὰ τετταράκοντα. τὸ δέ γε φύλλον οὐκ ἔλαττον ἔχει πέλτης, καρπὸν δὲ σφόδρα μικρὸν ἡλίκον ἐρέβινθον ὅμοιον δὲ σύκω· δι' ὃ καὶ ἐκάλουν αὐτὸν οἱ "Ἐλληνες συκῆν" ὀλίγον δὲ θαυμαστῶς τὸν καρπὸν οὐχ ὅτι κατὰ τὸ τοῦ δένδρου μέγεθος ἀλλὰ καὶ τὸ δλον. φύεται δὲ καὶ τὸ δένδρον περὶ τὸν Ἀκεσίνην ποταμόν.

5. Ἔστι δὲ καὶ ἔτερον δένδρον καὶ τῷ μεγέθει μέγα καὶ ἡδύκαρπον θαυμαστῶς καὶ μεγαλόκαρπον· καὶ χρῶνται τροφῆ τῶν Ἰνδῶν οἱ σοφοὶ καὶ μὴ ἀμπεχόμενοι.

"Ἐτερον δὲ οὐ τὸ φύλλον τὴν μὲν μορφὴν πρόμηκες τοῖς τῶν στρουθῶν πτεροῖς ὅμοιον, ἀπαρατίθενται παρὰ τὰ κράνη, μῆκος δὲ ὡς διπηχυαῖον.

"Άλλο τέ ἔστιν οὐ ὁ καρπὸς μακρὸς καὶ οὐκ εὐθὺς ἀλλὰ σκολιὸς ἐσθιόμενος δὲ γλυκύς. οὗτος ἐν τῇ κοιλίᾳ δηγμὸν ἐμποιεῖ καὶ δυσεντερίαν, δι' ὃ Ἀλέξανδρος ἀπεκήρυξε μὴ ἐσθίειν. ἔστι δὲ καὶ ἔτερον οὐ ὁ καρπὸς ὅμοιος τοῖς κρανέοις.

¹ οὖν conj. W.; αἰς UΜV Ald.

² ἄφυλλοι conj. Dalec.; δίφυλλοι UV Ald.; so also MH., omitting καὶ.

³ ἔξήκοντα . . . τετταράκοντα MSS.; ξι . . . τεττάρων conj. Salm. cf. Plin. l.c.; Strabo 15. 1. 21.

ENQUIRY INTO PLANTS, IV. iv. 4-5

which ¹ men sometimes even live. The roots as they grow are easily distinguished from the branches, being whiter hairy crooked and leafless.² The foliage above is also abundant, and the whole tree is round and exceedingly large. They say that it extends its shade for as much as two furlongs ; and the thickness of the stem is in some instances more than sixty³ paces, while many specimens are as much as forty³ paces through. The leaf is quite as large as a shield,⁴ but the fruit is very small,⁵ only as large as a chick-pea, and it resembles a fig. And this is why the Greeks⁶ named this tree a 'fig-tree.' The fruit is curiously scanty, not only relatively to the size of the tree, but absolutely. The tree also grows near the river Akesines.⁷

There is also another tree⁸ which is very large and has wonderfully sweet and large fruit ; it is used for food by the sages of India who wear no clothes.

There is another tree⁹ whose leaf is oblong in shape, like the feathers of the ostrich ; this they fasten on to their helmets, and it is about two cubits long.

There is also another¹⁰ whose fruit is long and not straight, but crooked, and it is sweet to the taste. This causes griping in the stomach and dysentery ; wherefore Alexander ordered that it should not be eaten. There is also another¹¹ whose fruit is like the fruit of the cornelian cherry.

⁴ πέλτη : a small round shield.

⁵ cf. C.P. 2. 10. 2.

⁶ i.e. in Alexander's expedition.

⁷ Chenab.

⁸ Jack-fruit. See Index App. (3). Plin. 12. 24.

⁹ Banana. See Index App. (4).

¹⁰ Mango. See Index App. (5). Plin. 12. 24.

¹¹ Jujube. See Index App. (6).

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Καὶ ἔτερα δὲ πλείω καὶ διαφέροντα τῶν ἐν τοῖς "Ελλησιν ἀλλ' ἀνώνυμα. θαυμαστὸν δ' οὐδὲν τῆς ἴδιότητος· σχεδὸν γάρ, ὡς γε δή τινες φασιν, οὐθὲν ὅλως τῶν δένδρων οὐδὲ τῶν ὑλημάτων οὐδὲ τῶν ποιωδῶν ὅμοιόν ἔστι τοῖς ἐν τῇ Ἑλλάδι πλὴν ὀλίγων.

6 Ἰδιον δὲ καὶ ἡ ἐβένη τῆς χώρας ταύτης· ταύτης δὲ δύο γένη, τὸ μὲν εὐξυλον καὶ καλὸν τὸ δὲ φαῦλον. σπάνιον δὲ τὸ καλὸν θάτερον δὲ πολύ. τὴν δὲ χρόαν οὐ θησαυριζομένη λαμβάνει τὴν εὐχροον ἀλλ' εὐθὺς τῇ φύσει. ἔστι δὲ τὸ δένδρον θαμνῶδες, ὥσπερ ὁ κύτισος.

7 Φασὶ δὲ εἶναι καὶ τέρμινθον, οἱ δὲ ὅμοιον τερμίνθῳ, ὃ τὸ μὲν φύλλον καὶ τοὺς κλῶνας καὶ τὰλλα πάντα ὅμοια ἔχει τῇ τερμίνθῳ· τὸν δὲ καρπὸν διάφορον ὅμοιον γάρ ταῖς ἀμυγδαλαῖς. εἶναι γάρ καὶ ἐν Βάκτροις τὴν τέρμινθον ταύτην καὶ κάρυνα φέρειν ἡλικα ἀμύγδαλα διὰ τὸ μὴ μεγάλα· καὶ τῇ ὅψει δὲ παρόμοια, πλὴν τὸ κέλυφος οὐ τραχύ, τῇ δὲ εὐστομίᾳ καὶ ἥδονῇ κρείττω τῶν ἀμυγδάλων. δι' ὃ καὶ χρῆσθαι τοὺς ἔκει μᾶλλον.

8 Ἐξ ὧν δὲ τὰ ἴμάτια ποιοῦσι τὸ μὲν φύλλον ὅμοιον ἔχει τῇ συκαμίνῳ, τὸ δὲ ὅλον φυτὸν τοῖς κυνορόδοις ὅμοιον. φυτεύουσι δὲ ἐν τοῖς πεδίοις αὐτὸν κατ' ὅρχους, δι' ὃ καὶ πόρρωθεν ἀφορῶσι ἄμπελοι φαίνονται. ἔχει δὲ καὶ φοίνικας ἔνια

¹ Plin. 12. 25.

² See Index. Plin. 12. 17-19.

³ Pistachio-nut. See Index App. (7). Plin. 12. 25. Nic. Ther. 894.

ENQUIRY INTO PLANTS, IV. iv. 5-8

There are also many more¹ which are different to those found among the Hellenes, but they have no names. There is nothing surprising in the fact that these trees have so special a character; indeed, as some say, there is hardly a single tree or shrub or herbaceous plant, except quite a few, like those in Hellas.

The ebony² is also peculiar to this country; of this there are two kinds, one with good handsome wood, the other inferior. The better sort is rare, but the inferior one is common. It does not acquire its good colour by being kept, but it is natural to it from the first. The tree is bushy, like laburnum.

Some say that a 'terebinth'³ grows there also, others that it is a tree like the terebinth; this in leaf twigs and all other respects resembles that tree, but the fruit is different, being like almonds. In fact they say that this sort of terebinth grows also in Bactria and bears nuts only as big as almonds, inasmuch as they are not large for the size of the tree⁴; and they closely resemble almonds in appearance, except that the shell is not rough; and in palatableness and sweetness they are superior to almonds; wherefore the people of the country use them in preference to almonds.

⁵ The trees from which they make their clothes have a leaf like the mulberry, but the whole tree resembles the wild rose. They plant them in the plains in rows, wherefore, when seen from a distance, they look like vines. Some parts also have many

¹ διὰ . . . μέγαλα: Sch. omits these words, and W. considers them corrupt; but G seems to have had them in his text. The translation is tentative.

² Cotton-plant. cf. 4. 7. 7 and 8. Plin. 12. 25.

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μέρη πολλούς. καὶ ταῦτα μὲν ἐν δένδρου φύσει.

9 Φέρει δὲ καὶ σπέρματα ἵδια, τὰ μὲν τοῖς χεδροποῖς ὅμοια τὰ δὲ τοῖς πυροῖς καὶ ταῖς κριθαῖς. ἐρέβινθος μὲν γάρ καὶ φακὸς καὶ τάλλα τὰ παρ' ἡμῖν οὐκ ἔστιν. ἔτερα δὲ ἔστιν ὥστε παραπλήσια ποιεῖν τὰ ἐψήματα καὶ μὴ διαγνωσκειν, ὡς φασιν, ἀν μή τις ἀκούσῃ. κριθαὶ δὲ καὶ πυροὶ καὶ ἄλλο τι γένος ἀγρίων κριθῶν, ἐξ ὧν καὶ ἄρτοι ἡδεῖς καὶ χόνδρος καλός. ταύτας οἱ ἵπποι ἔσθιοντες τὸ πρώτον διεφθείροντο, κατὰ μικρὸν δὲ οὖν ἔθισθέντες ἐν ἀχύροις οὐδὲν ἔπασχον.

10 Μάλιστα δὲ σπείρουσι τὸ καλούμενον ὅρυζον, ἐξ οὐν τὸ ἐψῆμα. τοῦτο δὲ ὅμοιον τῇ ζειᾱͅ καὶ περιπτισθὲν οίον χόνδρος εὔπεπτον δέ, τὴν ὅψιν πεφυκὸς ὅμοιον ταῖς αἴραις καὶ τὸν πολὺν χρόνον ἐν ὕδατι, ἀποχεῖται δὲ οὐκ εἰς στάχυν ἀλλ' οίον φόβην, ὥσπερ ὁ κέγχρος καὶ ὁ ἐλυμος. ἄλλο δὲ δὲ ἐκάλουν οἱ "Ελληνες φακόν" τοῦτο δὲ ὅμοιον μὲν τῇ ὅψει καὶ τὸ βούκερας, θερίζεται δὲ περὶ Πλειάδος δύσιν.

11 Διαφέρει δὲ καὶ αὕτη ἡ χώρα τῷ τὴν μὲν φέρειν ἔνια τὴν δὲ μὴ φέρειν· ἡ γὰρ ὄρεινὴ καὶ ἄμπελον ἔχει καὶ ἐλάαιν καὶ τὰ ἄλλα ἀκρόδρυα· πλὴν ἄκαρπον τὴν ἐλάαιν, καὶ σχεδὸν καὶ τὴν φύσιν ὥσπερ μεταξὺ κοτίνου καὶ ἐλάας ἔστι καὶ

¹ cf. 8. 4. 2. whence it appears that the original text here contained a fuller account. Plin. 18. 71.

² *Sorghum halepense*. ³ Sc. of Alexander.

⁴ The verb seems to have dropped out (W.).

date-palms. So much for what come under the heading of 'trees.'

These lands bear also peculiar grains, some like those of leguminous plants, some like wheat and barley. For the chick-pea lentil and other such plants found in our country do not occur; but there are others, so that they make similar mashes, and one cannot, they say, tell the difference, unless one has been told. They have however barley wheat¹ and another kind of wild barley,² which makes sweet bread and good porridge. When the horses³ ate this, at first it proved fatal to them, but by degrees they became accustomed to it mixed with bran and took no hurt.

But above all they sow the cereal called rice, of which they make their mash. This is like rice-wheat, and when bruised makes a sort of porridge, which is easily digested; in its appearance as it grows it is like darnel, and for most of its time of growth it is⁴ in water; however it shoots⁵ up not into an ear, but as it were into a plume,⁶ like the millet and Italian millet. There was another plant⁷ which the Hellenes⁸ called lentil; this is like in appearance to 'ox-horn' (fenugreek), but it is reaped about the setting of the Pleiad.

Moreover this country shews differences in that part of it bears certain things which another part does not; thus the mountain country has the vine and olive and the other fruit-trees; but the olive is barren,⁹ and in its character it is as it were almost between a wild and a cultivated olive, and so it

⁵ ἀποχεῖται: cf. 8. 8. 1. ⁶ cf. 8. 3. 4.

⁷ *Phaseolus Mungo*; see Index App. (8).

⁸ i.e. of Alexander's expedition.

⁹ Plin. 12. 14.

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τῇ ὅλῃ μορφῇ· καὶ τὸ φύλλον τοῦ μὲν πλατύτερον τοῦ δὲ στενότερον. ταῦτα μὲν οὖν κατὰ τὴν Ἰνδικήν.

12 'Εν δὲ τῇ Ἀρίᾳ χώρᾳ καλουμένη ἄκανθά ἐστιν, ἐφ' ἡς γίνεται δάκρυον ὅμοιον τῇ σμύρνῃ καὶ τῇ ὄψει καὶ τῇ ὀσμῇ· τοῦτο δὲ ὅταν ἐπιλάμψῃ ὁ ἥλιος καταρρεῖ· πολλὰ δὲ καὶ ἄλλα παρὰ τὰ ἐνταῦθα καὶ ἐν τῇ χώρᾳ καὶ ἐν τοῖς ποταμοῖς γίνεται. ἐν ἑτέροις δὲ τόποις ἐστὶν ἄκανθα λευκὴ τρίοζος, ἐξ ἡς καὶ σκυτάλια καὶ βακτηρίας ποιοῦσιν· ὀπώδης δὲ καὶ μανή· ταύτην δὲ καλοῦσιν 'Ηρακλέους.

Ἄλλο δὲ ὑλημα μέγεθος μὲν ἥλικον ράφανος, τὸ δὲ φύλλον ὅμοιον δάφνη καὶ τῷ μεγέθει καὶ τῇ μορφῇ. τοῦτο δ' εἰ τι φάγοι ἐναποθνήσκει. δι' δὲ καὶ ὅπου ἵπποι τούτους ἐφύλαττον διὰ χειρῶν.

13 'Εν δὲ τῇ Γεδρωσίᾳ χώρᾳ πεφυκέναι φασὶν ἐν μὲν ὅμοιον τῇ δάφνῃ φύλλον ἔχον, οὐ τὰ ὑποζύγια καὶ ὄτιον εἰ φάγοι μικρὸν ἐπισχόντα διεφθείροντο παραπλησίως διατιθέμενα καὶ σπώμενα ὄμοίως τοῖς ἐπιλήπτοις.

Ἐτερον δὲ ἄκανθάν τινα εἶναι· ταύτην δὲ φύλλον μὲν οὐδὲν ἔχειν πεφυκέναι δ' ἐκ μᾶς ρίζης· ἐφ' ἑκάστῳ δὲ τῶν ὅξων ἄκανθαν ἔχειν ὀξείαν σφόδρα, καὶ τούτων δὲ καταγνυμένων ἡ προστριβομένων ὀπὸν ἐκρεῖν πολύν, διὰ ποτυφλοῖ

¹ καὶ σχεδὸν . . . μορφῇ conj. W.; σχεδὸν δὲ καὶ τὴν φύσιν ὥσπερ μετ. κοτ. καὶ ἐλ. ἐστι δὲ τῇ ὅλῃ μορφῇ καὶ τὸ φ. Ald.; so also U, omitting the first καὶ.

² *Balsamodendron Mukul*; see Index App. (9). Plin. 12. 33.

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is also in its general appearance,¹ and the leaf is broader than that of the one and narrower than that of the other. So much for the Indian land.

In the country called Aria there is a 'thorn'² on which is found a gum resembling myrrh³ in appearance and smell, and this drops when the sun shines on it. There are also many other plants besides those of our land, both in the country and in its rivers. In other parts there is a white 'thorn'⁴ which branches in three, of which they make batons and sticks; its wood is sappy and of loose texture, and they call it the thorn 'of Herakles.'

There is another shrub⁵ as large as a cabbage, whose leaf is like that of the bay in size and shape. And if any animal should eat this, it is certain to die of it. Wherefore, wherever there were horses,⁶ they kept them under control.

In Gedrosia they say that there grows one tree⁷ with a leaf like that of the bay, of which if the beasts or anything else ate, they very shortly died with the same convulsive symptoms as in epilepsy.

And they say that another tree⁸ there is a sort of 'thorn' (spurge), and that this has no leaf and grows from a single root; and on each of its branches it has a very sharp spine, and if these are broken or bruised a quantity of juice flows out, which blinds animals or

³ σμύρη conj. Sch. from 9. 1. 2; Plin. l.c.; τῆς ἵλλυρίας Ald. H.

⁴ See Index.

⁵ *Asafoetida*; see Index App. (10). Plin. 12. 33.

⁶ i.e. in Alexander's expedition. Probably a verb, such as ὥσφαλνοτο, has dropped out after ιπποι (Sch.). *Odore equos invitans* Plin. l.c.

⁷ *Nerium odoratum*; see Index App. (11). cf. 4. 4. 13; Strabo 15. 2. 7; Plin. l.c.

⁸ Plin. l.c.; Arrian, *Anab.* 6. 22. 7.

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τάλλα ζῶα πάντα καὶ πρὸς τοὺς ἀνθρώπους εἴ τις προσράίνειεν αὐτοῖς. ἐν δὲ τόποις τισὶ πεφυκέναι τινὰ βοτάνην, ὑφ' ἡ συνεσπειρωμένους ὅφεις εἶναι μικροὺς σφόδρα· τούτοις δ' εἴ τις ἐμβὰς πληγείη θυνῆσκεν. ἀποπνίγεσθαι δὲ καὶ ἀπὸ τῶν φοινίκων τῶν ὡμῶν εἴ τις φάγοι, καὶ τοῦτο ὕστερον κατανοηθῆναι. τοιαῦται μὲν οὖν δυνάμεις καὶ ζῶων καὶ φυτῶν ἵσως καὶ παρ' ἄλλοις εἰσί.

14 Περιπτότερα δὲ τῶν φυομένων καὶ πλεῖστον ἔξηλλαγμένα πρὸς τὰ ἄλλα τὰ εὔοσμα τὰ περὶ Ἀραβίαν καὶ Συρίαν καὶ Ἰνδούς, οἷον ὅ τε λιβανωτὸς καὶ ἡ σμύρνα καὶ ἡ κασία καὶ τὸ ὄποιβάλσαμον καὶ τὸ κινάμωμον καὶ ὅσα ἄλλα τοιαῦτα· περὶ ὧν ἐν ἄλλοις εἴρηται διὰ πλειόνων. ἐν μὲν οὖν τοῖς πρὸς ἔω τε καὶ μεσημβρίαν καὶ ταῦτ' ἴδια καὶ ἔτερα δὲ τούτων πλείω ἐστίν.

V. Ἐν δὲ τοῖς πρὸς ἄρκτον οὐχ ὅμοιώς οὐθὲν γὰρ ὅτι ἄξιον λόγου λέγεται παρὰ τὰ κοινὰ τῶν δένδρων ἀ καὶ φιλόψυχρά τε τυγχάνει καὶ ἔστι καὶ παρ' ἡμῖν, οἷον πεύκη δρῦς ἐλάτη πύξις διοσβάλανος φίλυρα καὶ τὰ ἄλλα δὲ τὰ τοιαῦτα· σχεδὸν γὰρ οὐδὲν ἔτερον παρὰ ταῦτα ἐστιν, ἀλλὰ τῶν ἄλλων ὑλημάτων ἔνια ἀ τοὺς ψυχροὺς μᾶλλον ζητεῖ τόπους, καθάπερ κενταύριον ἀψίνθιον, ἔτι δὲ τὰ φαρμακώδη ταῖς ρίζαις καὶ τοῖς ὄποις, οἷον ἐλλέβορος ἐλατήριον σκαμμωνία, σχεδὸν πάντα τὰ ρίζοτομούμενα.

2 Τὰ μὲν γὰρ ἐν τῷ Πόντῳ καὶ τῇ Θράκῃ γίνεται,

¹ τὰ ἄλλὰ δὲ: ? om. τὰ; δὲ om. Sch.

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even a man, if any drops of it should fall on him. Also they say that in some parts grows a herb under which very small snakes lie coiled up, and that, if anyone treads on these and is bitten, he dies. They also say that, if anyone should eat of unripe dates, he chokes to death, and that this fact was not discovered at first. Now it may be that animals and plants have such properties elsewhere also.

Among the plants that grow in Arabia Syria and India the aromatic plants are somewhat exceptional and distinct from the plants of other lands; for instance, frankincense myrrh cassia balsam of Mecca cinnamon and all other such plants, about which we have spoken at greater length elsewhere. So in the parts towards the east and south there are these special plants and many others besides.

Of the plants special to northern regions.

V. In the northern regions it is not so, for nothing worthy of record is mentioned except the ordinary trees which love the cold and are found also in our country, as fir oak silver-fir box chestnut lime, as well as other similar trees. There is hardly any other¹ besides these; but of shrubs there are some which for choice² seek cold regions, as centaury and wormwood, and further those that have medicinal properties in their roots and juices, such as hellebore squirting cucumber scammony, and nearly all those whose roots are gathered.³

Some of these grow in Pontus and Thrace, some

² I have moved *μᾶλλον*, which in the MSS. comes before *τῶν* *τάλλων*.

³ i.e. which have medicinal uses.

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τὰ δὲ περὶ τὴν Οἴτην καὶ τὸν Παρνασὸν καὶ τὸ Πήλιον καὶ τὴν Ὀσσαν καὶ τὸ Τελέθριον· καὶ ἐν τούτοις δέ τινες φασι πλεῖστον πολλὰ δὲ καὶ ἐν τῇ Ἀρκαδίᾳ καὶ ἐν τῇ Λακωνικῇ· φαρμακώδεις γάρ καὶ αὗται. τῶν δὲ εὐώδῶν οὐδὲν ἐν ταύταις, πλὴν ἵρις ἐν τῇ Ἰλλυρίδι καὶ περὶ τὸν Ἀδρίαν· ταύτη γάρ χρηστὴ καὶ πολὺ διαφέρουσα τῶν ἄλλων· ἀλλ' ἐν τοῖς ἀλεεινοῖς καὶ τοῖς πρὸς μεσημβρίαν ὥσπερ ἀντικείμενα τὰ εὐώδη. ἔχουσι δὲ καὶ κυπάριστον οἱ ἀλεεινοὶ μᾶλλον, ὥσπερ Κρήτη Λυκία Ῥόδος, κέδρον δὲ καὶ τὰ Θράκια ὅρη καὶ τὰ Φρύγια.

3 Τῶν δὲ ἡμερουμένων ἥκιστά φασιν ἐν τοῖς ψυχροῖς ὑπομένειν δάφνην καὶ μυρρίνην, καὶ τούτων δὲ ἡττον ἔτι τὴν μυρρίνην· σημεῖον δὲ λέγουσιν ὅτι ἐν τῷ Ὁλύμπῳ δάφνη μὲν πολλή, μύρρινος δὲ ὄλως οὐκ ἔστιν. ἐν δὲ τῷ Πόντῳ περὶ Παντικάπαιον οὐδὲ ἔτερον καίπερ σπουδαζόντων καὶ πάντα μηχανωμένων πρὸς τὰς Ἱεροσύνας· συκαῖ δὲ πολλὰλ καὶ εὔμεγέθεις καὶ ροιαὶ δὲ περισκεπταζόμεναι· ἄπιοι δὲ καὶ μηλέαι πλεῖσται καὶ παντοδαπώταται καὶ χρησταῖ· αὗται δ' ἔαριναὶ πλὴν εἰ ἄρα δψιαι· τῆς δὲ ἀγρίας ὅλης ἔστι δρῦς πτελέα μελία καὶ ὅσα τοιαῦτα· πεύκη δὲ καὶ ἐλάτη καὶ πίτυς οὐκ ἔστιν οὐδὲ ὄλως οὐδὲν ἔνδαδον· ὑγρὰ δὲ αὗτη καὶ χείρων πολὺ τῆς Σινωπικῆς, ὥστ' οὐδὲ πολὺ χρῶνται αὐτῇ πλὴν πρὸς τὰ ὑπαίθρια. ταῦτα

¹ Τελέθριον conj. Sch. (in Euboea), cf. 9. 15. 4; Πελέθριον UMVP; Παρθένιον Ald. G.

² Whose rhizome was used for perfumes; cf. 1. 7. 2; de odor. 22. 23. 28. 32; Dykes, *The Genus Iris*, p. 237, gives an interesting account of the modern uses of 'orris-root.'

ENQUIRY INTO PLANTS, IV. v. 2-3

about Oeta Parnassus Pelion Ossa and Telethrion,¹ and in these parts some say that there is great abundance; so also is there in Arcadia and Laconia, for these districts too produce medicinal plants. But of the aromatic plants none grows in these lands, except the iris² in Illyria on the shores of the Adriatic; for here it is excellent and far superior to that which grows elsewhere; but in hot places and those which face the south the fragrant plants grow, as if by contrast to the medicinal plants. And the warm places have also the cypress in greater abundance; for instance, Crete Lycia Rhodes, while the prickly cedar grows in the Thracian and the Phrygian mountains.

Of cultivated plants they say that those least able to thrive in cold regions are the bay and myrtle, especially the myrtle, and they give for proof³ that on Mount Olympus the bay is abundant, but the myrtle does not occur at all. In Pontus about Panticapaeum neither grows, though they are anxious to grow them and take special pains⁴ to do so for religious purposes. But there are many well grown fig-trees and pomegranates, which are given shelter; pears and apples are abundant in a great variety of forms and are excellent. These are spring-fruiting trees, except that they may fruit later here than elsewhere. Of wild trees there are oak elm manna-ash and the like (while there is no fir silver-fir nor Aleppo pine, nor indeed any resinous tree). But the wood of such trees⁵ in this country is damp and much inferior to that of Sinope, so that they do not much use it except for outdoor purposes. These

³ Plin. 16. 137.

⁴ Plin., *l.c.*, says that Mithridates made this attempt.

⁵ *i.e.* oak, etc.

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μὲν οὖν περὶ τὸν Πόντον ἡ ἐν τισὶ γε τόποις
αὐτοῦ.

4 Ἐν δὲ τῇ Προποντίδι γίνεται καὶ μύρρινος καὶ
δάφνη πολλαχοῦ ἐν τοῖς ὅρεσιν. ἵσως δ' ἔνια
καὶ τῶν τόπων ἴδια θετέονται ἔκαστοι γὰρ ἔχουσι
τὰ διαφέροντα, ὥσπερ εἴρηται, κατὰ τὰς ὕλας οὐ
μόνον τῷ βελτίῳ καὶ χείρῳ τὴν αὐτὴν ἔχειν ἀλλὰ
καὶ τῷ φέρειν ἡ μὴ φέρειν· οἶνον ὁ μὲν Τμῶλος
ἔχει καὶ ὁ Μύσιος ¹Ολυμπος πολὺ τὸ κάρυον
καὶ τὴν διοσβάλανον, ἔτι δὲ ἀμπελον καὶ μηλέαν
καὶ ρόαν· ἡ δὲ ²Ιδη τὰ μὲν οὐκ ἔχει τούτων τὰ
δὲ σπάνια· περὶ δὲ Μακεδονίαν καὶ τὸν Πιερικὸν
³Ολυμπον τὰ μὲν ἔστι τὰ δ' οὐκ ἔστι τούτων· ἐν
δὲ τῇ Εὐβοίᾳ καὶ περὶ τὴν Μαγνησίαν τὰ μὲν
Εὐβοϊκὰ πολλὰ τῶν δὲ ἄλλων οὐθέν· οὐδὲ δὴ περὶ⁴
τὸ Πέλιον οὐδὲ τὰ ἄλλα τὰ ἐνταῦθα ὅρη.

5 Βραχὺς δ' ἔστι τόπος δις ἔχει καὶ δλως τὴν
ναυπηγήσιμον ὕλην· τῆς μὲν γὰρ Εύρωπης δοκεῖ
τὰ περὶ τὴν Μακεδονίαν καὶ δσα τῆς Θράκης καὶ
περὶ Ἰταλίαν· τῆς δὲ Ἀσίας τά τε ἐν Κιλικίᾳ
καὶ τὰ ἐν Σινώπῃ καὶ Ἀμίσῳ, ἔτι δὲ ὁ Μύσιος
⁵Ολυμπος καὶ ἡ ⁶Ιδη πλὴν οὐ πολλήν· ἡ γὰρ
Συρία κέδρον ἔχει καὶ ταύτη χρῶνται πρὸς τὰς
τριήρεις.

6 Ἀλλὰ καὶ τὰ φίλυδρα καὶ τὰ παραποτάμια
ταῦθ' ὄμοιώσ· ἐν μὲν γὰρ τῷ Ἀδρίᾳ πλάτανον οὐ
φασιν εἶναι πλὴν περὶ τὸ Διομήδους ἱερόν·
σπανίαν δὲ καὶ ἐν Ἰταλίᾳ πάσῃ· καίτοι πολλοὶ
καὶ μεγάλοι ποταμοὶ παρ' ἀμφοῖν· ἀλλ' οὐκ

¹ See Index.

² καὶ δσα: text probably defective, but sense clear. ?καὶ
δσα τῆς Θ. ἔχει καὶ τὰ περὶ Ἰ.

ENQUIRY INTO PLANTS, IV. v. 3-6

are the trees of Pontus, or at least of certain districts of that country.

In the land of Propontis myrtle and bay are found in many places on the mountains. Perhaps however some trees should be put down as special to particular places. For each district, as has been said, has different trees, differing not only in that the same trees occur but of variable quality, but also as to producing or not producing some particular tree. For instance, Tmolus and the Mysian Olympus have the hazel and chestnut¹ in abundance, and also the vine apple and pomegranate; while Mount Ida has some of these not at all and others only in small quantity; and in Macedonia and on the Pierian Olympus some of these occur, but not others; and in Euboea and Magnesia the sweet chestnut¹ is common, but none of the others is found; nor yet on Pelion or the other mountains of that region.

Again it is only a narrow extent of country which produces wood fit for shipbuilding at all, namely in Europe the Macedonian region, and certain parts² of Thrace and Italy; in Asia Cilicia Sinope and Amisus, and also the Mysian Olympus, and Mount Ida; but in these parts it is not abundant. For Syria has Syrian cedar, and they use this for their galleys.

The like is true of trees which love water and the riverside; in the Adriatic region they say that the plane is not found, except near the Shrine of Diomedes,³ and that it is scarce throughout Italy⁴; yet there are many large rivers in both countries, in spite of which the localities do not seem to

³ On one of the islands of Diomedes, off the coast of Apulia; now called Isole di Tremiti. cf. Plin. 12. 6.

⁴ cf. 2. 8. 1 n.

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ἔοικε φέρειν ὁ τόπος· ἐν Ἀρηγίῳ γοῦν ἀς Διονύσιος πρεσβύτερος ὁ τύραννος ἐφύτευσεν ἐν τῷ παραδείσῳ, αἴ εἰσι νῦν ἐν τῷ γυμνασίῳ, φιλοτιμηθεῖσαι οὐ δεδύνηται λαβεῖν μέγεθος.

7 Ἐνιοι δὲ πλείστην ἔχουσι πλάτανον, οἵ δὲ πτελέαν καὶ ἵτεαν, οἵ δὲ μυρίκην, ὥσπερ ὁ Αἴμος. ὥστε τὰ μὲν τοιαῦτα, καθάπερ ἐλέχθη, τῶν τόπων ἵδια θετέον ὁμοίως ἐν τε τοῖς ἀγρίοις καὶ τοῖς ἡμέροις. οὐ μὴν ἀλλὰ τάχ' ἀν εἴη καὶ τούτων ἐπί τινων ὥστε διακοσμηθέντων δύνασθαι τὴν χώραν φέρειν, ὃ καὶ νῦν ξυμβαῖνον ὄρωμεν καὶ ἐπὶ ζώων ἐνίων καὶ φυτῶν.

VI. Μεγίστην δὲ διαφορὰν αὐτῆς τῆς φύσεως τῶν δένδρων καὶ ἀπλῶς τῶν ὑλημάτων ὑποληπτέον ἦν καὶ πρότερον εἴπομεν, ὅτι τὰ μὲν ἔγγαια τὰ δ' ἔνυδρα τυγχάνει, καθάπερ τῶν ζώων, καὶ τῶν φυτῶν· οὐ μόνον ἐν τοῖς ἔλεσι καὶ ταῖς λίμναις καὶ τοῖς ποταμοῖς γὰρ ἀλλὰ καὶ ἐν τῇ θαλάττῃ φύεται καὶ ὑλήματα ἔνια ἐν τε τῇ ἔξω καὶ δένδρα· ἐν μὲν γὰρ τῇ περὶ ἡμᾶς μικρὰ πάντα τὰ φυόμενα, καὶ οὐδὲν ὑπερέχον ὡς εἰπεῖν τῆς θαλάττης· ἐν ἐκείνῃ δὲ καὶ τὰ τοιαῦτα καὶ ὑπερέχοντα, καὶ ἔτερα δὲ μείζω δένδρα.

2 Τὰ μὲν οὖν περὶ ἡμᾶς ἔστι τάδε· φανερώτατα μὲν καὶ κοινότατα πᾶσιν τό τε φῦκος καὶ τὸ βρύον καὶ ὅσα ἄλλα τοιαῦτα· φανερώτατα δὲ καὶ

¹ φιλοτιμηθεῖσαι conj. St.; φιλοτιμηθεῖς MSS.; Plin. 12. 7.

² θαλάττης conj. Scal. from G; ἐλάτης Ald. H.

produce this tree. At any rate those which King Dionysius the Elder planted at Rhegium in the park, and which are now in the grounds of the wrestling school and are thought much of,¹ have not been able to attain any size.

Some of these regions however have the plane in abundance, and others the elm and willow, others the tamarisk, such as the district of Mount Haemus. Wherefore such trees we must, as was said, take to be peculiar to their districts, whether they are wild or cultivated. However it might well be that the country should be able to produce some of these trees, if they were carefully cultivated: this we do in fact find to be the case with some plants, as with some animals.

Of the aquatic plants of the Mediterranean.

VI. However the greatest difference in the natural character itself of trees and of tree-like plants generally we must take to be that mentioned already, namely, that of plants, as of animals, some belong to the earth, some to water. Not only in swamps, lakes and rivers, but even in the sea there are some tree-like growths, and in the ocean there are even trees. In our own sea all the things that grow are small, and hardly any of them rise above the surface²; but in the ocean we find the same kinds rising above the surface, and also other larger trees.

Those found in our own waters are as follows: most conspicuous of those which are of general occurrence are seaweed³ oyster-green and the like; most obvious of those peculiar to certain parts are the

¹ Plin. 13. 135.

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ιδιώτατα κατὰ τοὺς τόπους ἐλάτη συκῆ δρῦς ἄμπελος φοῖνιξ. τούτων δὲ τὰ μὲν πρόσγεια τὰ δὲ πόντια τὰ δ' ἀμφοτέρων τῶν τόπων κοινά. καὶ τὰ μὲν πολυειδῆ, καθάπερ τὸ φῦκος, τὰ δὲ μίαν ἴδεαν ἔχοντα. τοῦ γὰρ φύκους τὸ μέν ἔστι πλατύφυλλον ταινιοειδὲς χρῶμα ποῶδες ἔχον, δὲ δὴ καὶ πράσον καλοῦσί τινες, οἱ δὲ ζωστῆρα· ρίζαν δὲ ἔχει δασεῖαν ἔξωθεν ἐνδοθεν δὲ λεπυριώδη, μακρὰν δὲ ἐπιεικῶς καὶ εὐπαχῆ παρομοίαν τοῖς κρομιογυητείοις.

3 Τὸ δὲ τριχόφυλλον, ὥσπερ τὸ μάραθον, οὐ ποῶδες ἀλλ' ἔξωχρον οὐδὲ ἔχον καυλὸν ἀλλ' ὄρθον πως ἐν αὐτῷ φύεται δὲ τοῦτο ἐπὶ τῶν ὄστρακων καὶ τῶν λίθων, οὐχ ὥσπερ θάτερον πρὸς τῇ γῇ πρόσγεια δ' ἄμφω, καὶ τὸ μὲν τριχόφυλλον πρὸς αὐτῇ τῇ γῇ, πολλάκις δὲ ὥσπερ ἐπικλύζεται μόνον ὑπὸ τῆς θαλάττης, θάτερον δὲ ἀνωτέρω.

4 Γίνεται δὲ ἐν μὲν τῇ ἔξω τῇ περὶ Ἡρακλέους στήλας θαυμαστόν τι τὸ μέγεθος, ὡς φασι, καὶ τὸ πλάτος μείζον ὡς παλαιστιαῖον. φέρεται δὲ τοῦτο εἰς τὴν ἔσω θάλατταν ἀμα τῷ ρῷ τῷ ἔξωθεν καὶ καλοῦσιν αὐτὸ πράσον· ἐν ταύτῃ δὲ τοισι τόποις ὥστ' ἐπάνω τοῦ ὄμφαλοῦ. λέγεται δὲ ἐπέτειον εἶναι καὶ φύεσθαι μὲν τοῦ ἥρος λήγοντος, ἀκμάζειν δὲ τοῦ θέρους, τοῦ μετοπώρου δὲ φθίνειν, κατὰ δὲ τὸν χειμῶνα ἀπόλλυσθαι καὶ ἐκπίπτειν. ἄπαντα δὲ καὶ τάλλα τὰ φυόμενα χείρω καὶ ἀμαυρότερα γίνεσθαι τοῦ χειμῶνος.

¹ See Index: συκῆ, δρῦς, etc.

² ταινιοειδὲς conj. Dalec. ; τετανοειδὲς UP₂Ald.H.; τὰ τενοειδὲς MV. ³ cf. Diosc. 4. 99; Plin. 13. 136.

ENQUIRY INTO PLANTS, IV. vi. 2-4

sea-plants called 'fir' 'fig' 'oak' 'vine' 'palm.'¹ Of these some are found close to land, others in the deep sea, others equally in both positions. And some have many forms, as seaweed, some but one. Thus of seaweed there is the broad-leaved kind, riband-like² and green in colour, which some call 'green-weed' and others 'girdle-weed.' This has a root which on the outside is shaggy, but the inner part is made of several coats, and it is fairly long and stout, like *kromyogeteion* (a kind of onion).

³ Another kind has hair-like leaves like fennel, and is not green but pale yellow; nor has it a stalk, but it is, as it were, erect in itself; this grows on oyster-shells and stones, not, like the other, attached to the bottom; but both are plants of the shore, and the hair-leaved kind grows close to land, and sometimes is merely washed over by the sea⁴; while the other is found further out.

Again in the ocean about the pillars of Heracles there is a kind⁵ of marvellous size, they say, which is larger, about a palmsbreadth.⁶ This is carried into the inner sea along with the current from the outer sea, and they call it 'sea-leek' (riband-weed); and in this sea in some parts it grows higher than a man's waist. It is said to be annual and to come up at the end of spring, and to be at its best in summer, and to wither in autumn, while in winter it perishes and is thrown up on shore. Also, they say, all the other plants of the sea become weaker and feebler in winter. These then are, one may say, the

⁴ i.e. grows above low water mark.

⁵ See Index: *φῦκος* (2).

⁶ i.e. the 'leaf': the comparison is doubtless with *τὸ πλατύ*, § 2; *ως* UMVALd.; *ἢ* W. after Sch.'s conj.

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ταῦτα μὲν οὖν οἶον πρόσγεια περί γε τὴν θάλατταν. τὸ δὲ πόντιον φῦκος δοιὶ σπογγιεῖς ἀνακολυμβῶσι πελάγιον.

5 Καὶ ἐν Κρήτῃ δὲ φύεται πρὸς τῇ γῇ ἐπὶ τῶν πετρῶν πλεῦστον καὶ κάλλιστον φῶς βάπτουσιν οὐ μόνον τὰς ταινίας ἀλλὰ καὶ ἔρια καὶ ἴματια· καὶ ἔως ἂν ἡ πρόσφατος ἡ βαφή, πολὺ καλλίων ἡ χρόα τῆς πορφύρας· γίνεται δὲ ἐν τῇ προσβόρρῳ καὶ πλεῖον καὶ κάλλιον, ὥσπερ αἱ σπογγιαὶ καὶ ἄλλα τοιαῦτα.

6 Ἀλλο δὲ ἐστὶν ὅμοιον τῇ ἀγρώστει· καὶ γὰρ τὸ φύλλον παραπλήσιον ἔχει καὶ τὴν ρίζαν γονατώδη καὶ μακρὰν καὶ πεφυκυῖαν πλαγίαν, ὥσπερ ἡ τῆς ἀγρώστιδος· ἔχει δὲ καὶ καυλὸν καλαμώδη, καθάπερ ἡ ἀγρωστις· μεγέθει δὲ ἔλαττον πολὺ τοῦ φύκους.

“Αλλο δὲ τὸ βρύον, δο φύλλον μὲν ἔχει ποῶδες τῇ χρόᾳ, πλατὺ δὲ καὶ οὐκ ἀνόμοιον ταῖς θριδακίναις, πλὴν ρυτιδωδέστερον καὶ ὥσπερ συνεσπασμένον. καυλὸν δὲ οὐκ ἔχει, ἀλλ’ ἀπὸ μιᾶς ἀρχῆς πλείω τὰ τοιαῦτα καὶ πάλιν ἀπ’ ἄλλης· φύεται δὲ ἐπὶ τῶν λίθων τὰ τοιαῦτα πρὸς τῇ γῇ καὶ τῶν ὄστρακων. καὶ τὰ μὲν ἐλάττω σχεδὸν ταῦτ’ ἐστίν.

7 Ἡ δὲ δρῦς καὶ ἡ ἐλάτη παράγειοι μὲν ἄμφω φύονται δὲ ἐπὶ λίθοις καὶ ὄστρακοις ρίζας μὲν οὐκ ἔχουσαι, προσπεφυκυῖαι δὲ ὥσπερ αἱ λεπάδες. ἄμφότεραι μὲν οἶον σαρκόφυλλα· προμηκέστερον δὲ τὸ φύλλον πολὺ καὶ παχύτερον τῆς ἐλάτης

¹ Plin. 13. 136, cf. 32. 22; Diosc. 4. 99.

² litmus; see Index, φῦκος (5).

³ Plin. l.c.; grass-wrack, see Index, φῦκος (6).

sea-plants which are found near the shore. But the 'seaweed of ocean,' which is dived for by the sponge-fishers, belongs to the open sea.

¹ In Crete there is an abundant and luxuriant growth ² on the rocks close to land, with which they dye not only their ribbons, but also wool and clothes. And, as long as the dye is fresh, the colour is far more beautiful than the purple dye; it occurs on the north coast in greater abundance and fairer, as do the sponges and other such things.

³ There is another kind like dog's-tooth grass; the leaf is very like, the root is jointed and long, and grows out sideways, like that of that plant; it has also a reedy stalk like the same plant, and in size it is much smaller than ordinary seaweed.

⁴ Another kind is the oyster-green, which has a leaf green in colour, but broad and not unlike lettuce leaves; but it is more wrinkled ⁵ and as it were crumpled. It has no stalk, but from a single starting-point grow many of the kind, and again from another starting-point. These things grow on stones close to land and on oyster-shells. These are about all the smaller kinds.

⁶ The 'sea-oak' and 'sea-fir' both belong to the shore; they grow on stones and oyster-shells, having no roots, but being attached to them like limpets.⁷ Both have more or less fleshy leaves; but the leaf of the 'fir' grows much longer and stouter, and is ⁸

⁴ Plin. 13. 137; 27. 56; *Βρύον* conj. Scal. from G and Plin. *l.c.*; *βότρυον* U Ald. H.

⁵ *ρυτιδωδέστερον* conj. Scal. from G and Plin. *l.c.*; *χρυσιωδέστερον* Ald.; *ρυσιωδέστερον* m Bas.

⁶ Plin. *l.c.* ⁷ *λεπάδες* Ald.; *λοπάδες* W. with U M V.

⁸ *προμηκέστερον . . . πέφυκε καὶ* conj. W.; *προμ. δὲ τὸ φύλλον παχὺν καὶ παχύτερον τῆς ἐλάτης. πυλὺ δὲ καὶ* Ald.

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πέφυκε καὶ οὐκ ἀνόμοιον τοῖς τῶν ὁσπρίων λοβοῖς, κοῦλον δὲ ἔνδοθεν καὶ οὐδὲν ἔχον ἐν αὐτοῖς· τὸ δὲ τῆς δρυὸς λεπτὸν καὶ μυρικωδέστερον· χρῶμα δὲ ἐπιπόρφυρον ἀμφοῖν. ἡ δὲ ὄλη μορφὴ τῆς μὲν ἐλάτης ὄρθη καὶ αὐτῆς καὶ τῶν ἀκρεμόνων, τῆς δὲ δρυὸς σκολιωτέρα καὶ μᾶλλον ἔχουσα πλάτος.

8 γίνεται δὲ ἄμφω καὶ πολύκαυλα καὶ <μονόκαυλα,> μονοκαυλότερον δὲ ἡ ἐλάτη· τὰς δὲ ἀκρεμονικὰς ἀποφύσεις ἡ μὲν ἐλάτη μακρὰς ἔχει καὶ εὐθείας καὶ μανάς, ἡ δὲ δρῦς βραχυτέρας καὶ σκολιωτέρας καὶ πυκνοτέρας. τὸ δὲ ὄλον μέγεθος ἀμφοτέρων ὡς πυγωνιαῖον ἡ μικρὸν ὑπεραιῶν, μείζον δὲ ὡς ἀπλῶς εἰπεῖν τὸ τῆς ἐλάτης. χρήσιμον δὲ ἡ δρῦς εἰς Βαφὴν ἐρίων ταῖς γυναιξίν. ἐπὶ μὲν τῶν ἀκρεμόνων προσηρτημένα τῶν ὁστρακοδέρμων ζώων ἔνια· καὶ κάτω δὲ πρὸς αὐτῷ τῷ καυλῷ περιπεφυκότων τινῶν γ' ὅλω, ἐν τούτοις δεδυκότες ὄνιννοι τε καὶ ἄλλ' ἄττα καὶ τὸ ὄμοιον πολύποδι.

9 Ταῦτα μὲν οὖν πρόσγεια καὶ ῥάδια θεωρηθῆναι· φασὶ δέ τινες καὶ ἄλλην δρῦν εἶναι ποντίαν ἡ καὶ καρπὸν φέρει, καὶ ἡ βάλανος αὐτῆς χρησίμη· τοὺς δὲ σκινθοὺς καὶ κολυμβητὰς λέγειν ὅτι καὶ ἔτεραι μεγάλαι τινὲς τοῖς μεγέθεσιν εἴησαν.

‘Η δὲ ἄμπελος ἀμφοτέρωσε γίνεται· καὶ γὰρ πρὸς τῇ γῇ καὶ ποντίᾳ· μείζω δὲ ἔχει καὶ τὰ φύλλα καὶ τὰ κλήματα καὶ τὸν καρπὸν ἡ ποντία.

‘Η δὲ συκῆ ἄφυλλος μὲν τῷ δὲ μεγέθει οὐ μεγάλη, χρῶμα δὲ τοῦ φλοιοῦ φοινικοῦν.

¹ αὐτοῖς Ald. H.; αὐτῷ conj. W.

² I have inserted μονόκαυλα.

not unlike the pods of pulses, but is hollow inside and contains nothing in the 'pods.'¹ That of the 'oak' is slender and more like the tamarisk; the colour of both is purplish. The whole shape of the 'fir' is erect, both as to the stem and the branches, but that of the 'oak' is less straight and the plant is broader. Both are found both with many stems and with one,² but the 'fir' is more apt to have a single stem. The branchlike outgrowths in the 'fir' are long straight and spreading, while in the 'oak' they are shorter less straight and closer. The whole size of either is about a cubit or rather more, but in general that of the 'fir' is the longer. The 'oak' is useful to women for dyeing wool. To the branches are attached certain creatures with shells, and below they are also found attached to the stem itself, which in some cases they completely cover;³ and among these are found millepedes and other such creatures, including the one which resembles a cuttlefish.

These plants occur close to land and are easy to observe; but some report⁴ that there is another 'sea oak' which even bears fruit and has a useful 'acorn,' and that the sponge fishers⁵ and divers told them that there were other large kinds.

⁶ The 'sea-vine' grows under both conditions, both close to land and in the deep sea; but the deep sea form has larger leaves branches and fruit.

⁷ The 'sea-fig' is leafless and not of large size, and the colour of the bark is red.

³ *τινῶν γ' δλφ* conj. W.; *τινῶν δλων* Ald.; *τινῶν γε δλων* U; text uncertain: the next clause has no connecting particle.

⁴ Plin. 13. 137.

⁵ *σκίνθους*, a vox nihili: perhaps conceals a proper name, e.g. *Σικελικόν*; *σποργγεῖς* conj. St.

⁶ Plin. 13. 138. ⁷ Plin. l.c.

THEOPHRASTUS

10 Ὁ δὲ φοῖνίξ ἔστι μὲν πόντιον βραχυστέλεχες δὲ σφόδρα, καὶ σχεδὸν εὐθεῖαι αἱ ἐκφύσεις τῶν ῥάβδων· καὶ κάτωθεν οὐ κύκλῳ αῦται, καθάπερ τῶν ῥάβδων αἱ ἀκρεμόνες, ἀλλ ὡσὰν ἐν πλάτει κατὰ μίαν συνεχεῖς, ὀλιγαχοῦ δὲ καὶ ἀπαλλάττουσαι. τῶν δὲ ῥάβδων ἡ τῶν ἀποφύσεων τούτων ὁμοία τρόπον τινὰ ἡ φύσις τοῖς τῶν ἀκανθῶν φύλλοις τῶν ἀκανικῶν, οἷον σόγκοις καὶ τοῖς τοιούτοις, πλὴν ὅρθαι καὶ οὐχ, ὥσπερ ἐκεῖνα, περικεκλασμέναι καὶ τὸ φύλλον ἔχουσαι διαβεβρωμένον ὑπὸ τῆς ἄλμης· ἐπεὶ τό γε δι’ ὅλου ἥκειν τὸν μέσον γε καυλὸν καὶ ἡ ἄλλη ὅψις παραπλησία. τὸ δὲ χρῶμα καὶ τούτων καὶ τῶν καυλῶν καὶ δλου τοῦ φυτοῦ ἔξερυθρόν τε σφόδρα καὶ φοινικοῦν.

Καὶ τὰ μὲν ἐν τῇδε τῇ θαλάττῃ τοσαῦτά ἔστιν. ἡ γὰρ σπογγιὰ καὶ αἱ ἀπλυσίαι καλούμεναι καὶ εἱ τι τοιοῦτον ἐτέραν ἔχει φύσιν.

VII. Ἐν δὲ τῇ ἔξω τῇ περὶ Ἡρακλέους στήλας τό τε πράσον, ὥσπερ εἴρηται, φύεται καὶ τὰ ἀπολιθούμενα ταῦτα, οἷον θῦμα καὶ τὰ δαφνοειδῆ καὶ τὰ ἄλλα. τῆς δὲ ἐρυθρᾶς καλουμένης ἐν τῇ Ἀραβίᾳ μικρὸν ἐπάνω Κόπτου ἐν μὲν τῇ γῇ

¹ κάτωθεν . . . , ἀπαλλάττουσαι probably beyond certain restoration: I have added καὶ before κάτωθεν (from G), altered κυκλωθὲν to κύκλῳ, put a stop before καὶ κάτωθεν, and restored ἀπαλλάττουσαι (Ald. H.). ² cf. 6. 4. 8 ; 7. 8. 3.

³ περικεκλασμένα, i.e. towards the ground. cf. Diosc. 3. 68 and 69, where Plin. (27. 13) renders (φύλλα) ὑποπερικλάται ad terram infracta.

ENQUIRY INTO PLANTS, IV. VI. 10-VII. 1

The 'sea-palm' is a deep-sea plant, but with a very short stem, and the branches which spring from it are almost straight; and these under water are not set all round the stem, like the twigs which grow from the branches, but extend, as it were, quite flat in one direction, and are uniform; though occasionally they are irregular.¹ The character of these branches or outgrowths to some extent resembles the leaves of thistle-like spinous plants, such as the sow-thistles² and the like, except that they are straight and not bent over³ like these, and have their leaves eaten away by the brine; in the fact that the central stalk⁴ at least runs through the whole, they resemble these, and so does the general appearance. The colour both of the branches and of the stalks and of the plant as a whole is a deep red or scarlet.

Such are the plants found in this sea. For sponges and what are called *aplysiæ*⁵ and such-like growths are of a different character.

Of the aquatic plants of the 'outer sea' (i.e. Atlantic, Persian Gulf, etc.).

VII. In the outer sea near the pillars of Heracles grows the 'sea-leek,' as has been said⁶; also the well known⁷ plants which turn to stone, as *thyma*, the plants like the bay and others. And in the sea called the Red Sea⁸ a little above Coptos⁹

¹ i.e. midrib.

² Some kind of sponge. *ἀπλυσίαι* conj. R. Const.; *πλυσίαι* UAld.; *πλυσίαι* M; *πλουσίαι* V. ⁶ 4. 6. 4.

³ *ταῦτα*: cf. 3. 7. 3; 3. 18. 11.

⁴ Plin. 13. 139.

⁵ *Κόπτον* conj. Scal.; *κόπτου* MV; *κόλπου* UAld.; *Copto* G and Plin. l.c.

THEOPHRASTUS

δένδρον οὐδὲν φύεται πλὴν τῆς ἀκάνθης τῆς διψάδος καλουμένης· σπανία δὲ καὶ αὕτη διὰ τὰ καύματα καὶ τὴν ἀνυδρίαν· οὐχ ὕει γὰρ ἀλλ' ἡ δι' ἑτῶν τεττάρων ἡ πέντε καὶ τότε λάβρως καὶ ἐπ' ὀλίγον χρόνον.

2 'Εν δὲ τῇ θαλάττῃ φύεται, καλοῦσι δ' αὐτὰ δάφνην καὶ ἐλάαν. ἔστι δὲ ἡ μὲν δάφνη ὁμοία τῇ ἀρίᾳ ἡ δὲ ἐλάα *<τῇ ἐλάᾳ>* τῷ φύλλῳ· καρπὸν δὲ ἔχει ἡ ἐλάα παραπλήσιον ταῖς ἐλάαις· ἀφίσι δὲ καὶ δάκρυον, ἐξ οὐ οἱ ἰατροὶ φάρμακον ἔναιμον συντιθέασιν δι γίνεται σφόδρα ἀγαθόν. ὅταν δὲ ὕδατα πλείω γένηται, μύκητες φύονται πρὸς τῇ θαλάττῃ κατά τινα τόπον, οὗτοι δὲ ἀπολιθοῦνται ὑπὸ τοῦ ἡλίου. ἡ δὲ θάλαττα θηριώδης· πλείστους δὲ ἔχει τοὺς καρχαρίας, ὥστε μὴ εἶναι κολυμβῆσαι.

'Εν δὲ τῷ κόλπῳ τῷ καλουμένῳ 'Ηρώων, ἐφ' ὃν καταβαίνουσιν οἱ ἐξ Αἰγύπτου, φύεται μὲν δάφνη τε καὶ ἐλάα καὶ θύμον, οὐ μὴν χλωρά γε ἀλλὰ λιθοειδῆ τὰ ὑπερέχοντα τῆς θαλάττης, ὁμοία δὲ καὶ τοῖς φύλλοις καὶ τοῖς βλαστοῖς τοῖς χλωροῖς. ἐν δὲ τῷ θύμῳ καὶ τὸ τοῦ ἄνθους χρῶμα διάδηλον ώστὲν μήπω τελέως ἔξηνθηκός. μήκη δὲ τῶν δευτροφίων ὅσον εἰς τρεῖς πήχεις.

3 Οἱ δέ, ὅτε ἀνάπλους ἦν τῶν ἐξ Ἰνδῶν ἀποσταλέντων ὑπὸ Ἀλεξάνδρου, τὰ ἐν τῇ θαλάττῃ φυόμενα, μέχρι οὐ μὲν ἀν ἡ ἐν τῷ ὑγρῷ, χρῶμά φασιν ἔχειν ὁμοίον τοῖς φυκίοις, ὅποταν δ' ἐξ-

¹ cf. Strabo 16. 1. 147. ² See Index.

³ The name of a tree seems to have dropped out: I have inserted τῇ ἐλάᾳ: cf. ταῖς ἐλάαις below. Bretzl suggests ἴδεα for ἀρίᾳ.

in Arabia there grows on the land no tree except that called the 'thirsty' acacia, and even this is scarce by reason of the heat and the lack of water; for it never rains except at intervals of four or five years, and then the rain comes down heavily and is soon over.

¹ But there are plants in the sea, which they call 'bay' and 'olive' (white mangrove ²). In foliage the 'bay' is like the *aria* (holm-oak), the 'olive' like the real olive.³ The latter has a fruit like olives, and it also discharges a gum,⁴ from which the physicians⁴ compound a drug⁵ for stanching blood, which is extremely effective. And when there is more rain than usual, mushrooms grow in a certain place close to the sea, which are turned to stone by the sun. The sea is full of beasts, and produces sharks⁶ in great numbers, so that diving is impossible.

In the gulf called 'the Gulf of the Heroes,'⁷ to which the Egyptians go down, there grow a 'bay,' an 'olive,' and a 'thyme'; these however are not green, but like stones so far as they project above the sea, but in leaves and shoots they are like their green namesakes. In the 'thyme' the colour of the flower is also conspicuous, looking as though the flower had not yet completely developed. These treelike growths are about three cubits in height.

⁸ Now some, referring to the occasion when there was an expedition of those returning from India sent out by Alexander, report that the plants which grow in the sea, so long as they are kept damp, have a colour

⁴ cf. Diosc. 1. 105 and 106.

⁵ cf. Athen. 4. 83; Plin. 12. 77.

⁶ Plin. 13. 139. ⁷ cf. 9. 4. 4.

⁸ Plin. 13. 140.

THEOPHRASTUS

ενεχθέντα τεθῆ πρὸς τὸν ἥλιον, ἐν ὀλίγῳ χρόνῳ
έξομοιούσθαι τῷ ἄλι. φύεσθαι δὲ καὶ σχοίνους
λιθίνους παρ' αὐτὴν τὴν θάλατταν, οὓς οὐδεὶς ἀν
διαγνοίη τῇ ὅψει πρὸς τοὺς ἀληθινούς. θαυμα-
σιώτερον δέ τι τούτου λέγουσι· φύεσθαι γὰρ
δευδρύφι' ἄττα τὸ μὲν χρῶμα ἔχοντα ὅμοιον
κέρατι βοὸς τοῖς δὲ ὅξοις τραχέα καὶ ἀπ' ἄκρου
πυρρά· ταῦτα δὲ θραύεσθαι μὲν εἰ συγκλώπῃ τις·
ἐκ δὲ τούτων πυρὶ ἐμβαλλόμενα, καθάπερ τὸν
σίδηρον, διάπυρα γινόμενα πάλιν ὅταν ἀποψύ-
χοιτο καθίστασθαι καὶ τὴν αὐτὴν χρόαν λαμ-
βάνειν.

4 Ἐν δὲ ταῖς νήσοις ταῖς ὑπὸ τῆς πλημμυρίδος
καταλαμβανομέναις δένδρα μεγάλα πεφυκέναι
ἡλίκαι πλάτανοι καὶ αἴγειροι αἱ μέγισται· συμ-
βαίνειν δέ, ὅθ' ἡ πλημμυρὶς ἐπέλθοι, τὰ μὲν ἄλλα
κατακρύπτεσθαι ὅλα, τῶν δὲ μεγίστων ὑπερέχειν
τοὺς κλάδους, ἐξ ὧν τὰ πρυμνησία ἀνάπτειν, εἰθ'
ὅτε πάλιν ἀμπωτις γίνοιτο ἐκ τῶν ρίζῶν. ἔχειν
δὲ τὸ δένδρον φύλλον μὲν ὅμοιον τῇ δάφνῃ, ἄνθος
δὲ τοῖς ἰοῖς καὶ τῷ χρώματι καὶ τῇ ὀσμῇ, καρπὸν
δὲ ἡλίκον ἐλάα καὶ τοῦτον εὐώδη σφόδρα· καὶ τὰ
μὲν φύλλα οὐκ ἀποβάλλειν, τὸ δὲ ἄνθος καὶ τὸν
καρπὸν ἄμα τῷ φθινοπώρῳ γίνεσθαι, τοῦ δὲ ἕαρος
ἀπορρεῖν.

5 Ἀλλα δ' ἐν αὐτῇ τῇ θαλάττῃ πεφυκέναι, ἀεί-
φυλλα μὲν τὸν δὲ καρπὸν ὅμοιον ἔχειν τοῖς
θέρμοις.

Περὶ δὲ τὴν Περσίδα τὴν κατὰ τὴν Καρμανίαν,
καθ' ὃ ἡ πλημμυρὶς γίνεται, δένδρα ἐστὶν εὐμεγέθη
ὅμοια τῇ ἀνδράχλῃ καὶ τῇ μορφῇ καὶ τοῖς φύλλοις·
καρπὸν δὲ ἔχει πολὺν ὅμοιον τῷ χρώματι ταῖς

ENQUIRY INTO PLANTS, IV. VII. 3-5

like sea-weeds, but that when they are taken out and put in the sun, they shortly become like salt. They also say that rushes of stone grow close to the sea, which none could distinguish at sight from real rushes. They also report a more marvellous thing than this ; they say that there are certain tree-like growths which in colour resemble an ox-horn, but whose branches are rough, and red at the tip ; these break if they are doubled up, and some of them, if they are cast on a fire, become red-hot like iron, but recover when they cool and assume their original colour.

¹ On the islands which get covered by the tide they say that great trees² grow, as big as planes or the tallest poplars, and that it came to pass that, when the tide³ came up, while the other things were entirely buried, the branches of the biggest trees projected and they fastened the stern cables to them, and then, when the tide ebbed again, fastened them to the roots. And that the tree has a leaf like that of the bay, and a flower like gilliflowers in colour and smell, and a fruit the size of that of the olive, which is also very fragrant. And that it does not shed its leaves, and that the flower and the fruit form together in autumn and are shed in spring.

⁴ Also they say there are plants which actually grow in the sea, which are evergreen and have a fruit like lupins.

⁵ In Persia in the Carmanian district, where the tide is felt, there are trees⁶ of fair size like the andrachne in shape and in leaves ; and they bear much fruit like

¹ Plin. 13. 141.

² Mangroves. See Index App. (12).

³ cf. Arr. *Anab.* 6. 22. 6.

⁴ Plin. *l.c.* Index App. (13). ⁵ Plin. 12. 37.

⁶ White mangroves. Index App. (14).

THEOPHRASTUS

ἀμυγδάλαις ἔξωθεν, τὸ δ' ἐντὸς συνελίππεται καθάπερ συνηρτημένον πᾶσιν. ὑποβέβρωται δὲ ταῦτα τὰ δένδρα πάντα κατὰ μέσον ὑπὸ τῆς θαλάττης καὶ ἔστηκεν ὑπὸ τῶν ρίζῶν, ὥσπερ πολύπους. ὅταν γὰρ ἡ ἄμπωτις γένηται θεωρεῖν 6 ἔστιν. ὕδωρ δὲ ὅλως οὐκ ἔστιν ἐν τῷ τόπῳ· καταλείπονται δέ τινες διώρυχες δι' ὧν διαπλέουσιν· αὗται δ' εἰσὶ θαλάττης· φέταὶ δὲ δῆλον οἰονται τινες ὅτι τρέφονται ταύτῃ καὶ οὐ τῷ ὕδατι, πλὴν εἴ τι ταῖς ρίζαις ἐκ τῆς γῆς ἐλκουσιν. εὐλογον δὲ καὶ τοῦθ' ἀλμυρὸν εἶναι· καὶ γὰρ οὐδὲ κατὰ βάθους αἱ ρίζαι. τὸ δὲ δλον ἐν τῷ γένοις εἶναι τῶν τ' ἐν τῇ θαλάττῃ φυομένων καὶ τῶν ἐν τῇ γῇ ὑπὸ τῆς πλημμυρίδος καταλαμβανομένων· καὶ τὰ μὲν ἐν τῇ θαλάττῃ μικρὰ καὶ φυκώδη φαινόμενα, τὰ δ' ἐν τῇ γῇ μεγάλα καὶ χλωρὰ καὶ ἄνθος εὔοδμον ἔχοντα, καρπὸν δὲ οίον θέρμος.

7 'Ἐν Τύλῳ δὲ τῇ νήσῳ, κεῖται δ' αὕτη ἐν τῷ 'Αραβίῳ κόλπῳ, τὰ μὲν πρὸς ἔω τοσοῦτο πλῆθος εἶναι φασι δένδρων ὅτ' ἐκβαίνει ἡ πλημμυρὶς ὥστ' ἀπωχυρώσθαι. πάντα δὲ ταῦτα μεγέθη μὲν ἔχειν ἡλίκα συκῆ, τὸ δὲ ἄνθος ὑπερβάλλον τῇ εὐώδίᾳ, καρπὸν δὲ ἀβρωτὸν ὅμοιον τῇ ὄψει τῷ θέρμῳ. φέρειν δὲ τὴν νῆσον καὶ τὰ δένδρα τὰ ἐριοφόρα πολλά. ταῦτα δὲ φύλλον μὲν ἔχειν παρόμοιον τῇ ἀμπέλῳ πλὴν μικρόν, καρπὸν δὲ οὐδένα φέρειν· ἐν φέταὶ δὲ τὸ ἐριον ἡλίκον μῆλον ἔαρινὸν συμμεμυκός· ὅταν δὲ ὡραῖον ἦ, ἐκπετάν-

¹ Plin. *l.c.* *Sicco litore radicibus nudis polyporum modo complexae steriles arenas aspectantur: he appears to have had a fuller text.*

in colour to almonds on the outside, but the inside is coiled up as though the kernels were all united.
¹ These trees are all eaten away up to the middle by the sea and are held up by their roots, so that they look like a cuttle-fish. For one may see this at ebb-tide. And there is no rain at all in the district, but certain channels are left, along which they sail, and which are part of the sea. Which, some think, makes it plain that the trees derive nourishment from the sea and not from fresh water, except what they draw up with their roots from the land. And it is reasonable to suppose that this too is brackish; for the roots do not run to any depth. In general they say that the trees which grow in the sea and those which grow on the land and are overtaken by the tide are of the same kind, and that those which grow in the sea are small and look like seaweed, while those that grow ² on land are large and green and have a fragrant flower and a fruit like a lupin.

In the island of Tylos,³ which is situated in the Arabian gulf,⁴ they say that on the east side there is such a number of trees when the tide goes out that they make a regular fence. All these are in size as large as a fig-tree, the flower is exceedingly fragrant, and the fruit, which is not edible, is like in appearance to the lupin. They say that the island also produces the 'wool-bearing' tree (cotton-plant) in abundance. This has a leaf like that of the vine, but small, and bears no fruit; but the vessel in which the 'wool' is contained is as large as a spring apple,

² φυκάδη φαινόμενα τὰ δ' ἐν conj. W.; φυκ. φυ. δ' ἐν MVAld.; U has φερόμενα (?).

³ cf. 5. 4. 6; Plin. 12. 38 and 39; modern name Bahrein.

⁴ i.e. Persian Gulf.

THEOPHRASTUS

ννσθαι καὶ ἔξειρειν τὸ ἔριον, ἔξ οὖ τὰς σινδόνας
ὑφαίνουσι, τὰς μὲν εύτελεῖς τὰς δὲ πολυτελε-
στάτας.

8 Γίνεται δὲ τοῦτο καὶ ἐν Ἰνδοῖς, ὥσπερ ἐλέχθη,
καὶ ἐν Ἀραβίᾳ. εἶναι δὲ ἄλλα δένδρα τὸ ἄνθος
ἔχοντα ὅμοιον τῷ λευκοῖῳ, πλὴν ἄοδμον καὶ τῷ
μεγέθει τετραπλάσιον τῶν ἵων. καὶ ἔτερον δέ τι
δένδρον πολύφυλλον ὥσπερ τὸ ρόδον· τοῦτο δὲ
τὴν μὲν νύκτα συμμέειν ἄμα δὲ τῷ ἡλίῳ ἀνιόντι
διοίγνυσθαι, μεσημβρίας δὲ τελέως διεπτύχθαι,
πάλιν δὲ τῆς δείλης συνάγεσθαι κατὰ μικρὸν καὶ
τὴν νύκτα συμμέειν· λέγειν δὲ καὶ τὸν ἐγχω-
ρίους ὅτι καθεύδει. γίνεσθαι δὲ καὶ φοίνικας ἐν
τῇ νήσῳ καὶ ἀμπέλους καὶ τάλλα ἀκρόδρυα καὶ
συκᾶς οὐ φυλλορροούσας. ὕδωρ δὲ οὐράνιον γίνε-
σθαι μέν, οὐ μὴν χρῆσθαι γε πρὸς τὸν καρπούς·
ἄλλ’ εἶναι κρήνας ἐν τῇ νήσῳ πολλάς, ἀφ’ ὧν
πάντα βρέχειν, δὲ καὶ συμφέρειν μᾶλλον τῷ σίτῳ
καὶ τοῖς δένδρεσιν. δι’ δὲ καὶ ὅταν ὑστῇ τοῦτο ἐπ-
αφιέναι καθαπερεὶ καταπλύνοντας ἐκεῖνο. καὶ
τὰ μὲν ἐν τῇ ἔξῳ θαλάττῃ δένδρα τά γε νῦν
τεθεωρημένα σχεδὸν τοσαῦτά ἔστιν.

VIII. Ὄτι πέρ δὲ τῶν ἐν τοῖς ποταμοῖς καὶ τοῖς
ἔλεσι καὶ ταῖς λίμναις μετὰ ταῦτα λεκτέον. τρία
δέ ἔστιν εἴδη τῶν ἐν τούτοις, τὰ μὲν δένδρα τὰ δ’

¹ ἔξειρειν conj. W.; ἔξειαρειν P₂; ἔξαρειν Ald. ² 4. 5. 8.

³ Tamarind. See Index App. (15). Plin. 12. 40.

⁴ πλὴν ἄοδμον conj. H. Steph.; πλείονα ὅδμον UMAld.

⁵ τῷ μεγέθει καὶ I conj.; καὶ τῷ μεγέθει UMP; καὶ om. Ald.

⁶ Tamarind also. See Index App. (16). ⁷ i.e. leaflets.

⁸ *Ficus laccifera*. See Index App. (17). οὐ φυλλορροούσας
conj. W., cf. G and Plin. l.c.; αἱ φυλλορροοῦσιν Ald.H.

ENQUIRY INTO PLANTS, IV. VII. 7-VIII. 1

and closed, but when it is ripe, it unfolds and puts forth¹ the 'wool,' of which they weave their fabrics, some of which are cheap and some very expensive.

This tree is also found, as was said,² in India as well as in Arabia. They say that there are other trees³ with a flower like the gilliflower, but scentless⁴ and in size⁵ four times as large as that flower. And that there is another tree⁶ with many leaves⁷ like the rose, and that this closes at night, but opens at sunrise, and by noon is completely unfolded; and at evening again it closes by degrees and remains shut at night, and the natives say that it goes to sleep. Also that there are date-palms on the island and vines and other fruit-trees, including evergreen⁸ figs. Also that there is water from heaven, but that they do not use it for the fruits, but that there are many springs on the island, from which they water everything, and that this is more beneficial⁹ to the corn and the trees. Wherefore, even when it rains, they let this water over the fields,¹⁰ as though they were washing away the rain water. Such are the trees as so far observed which grow in the outer sea.

Of the plants of rivers, marshes, and lakes, especially in Egypt.

VIII. Next we must speak of plants which live in rivers marshes and lakes. Of these there are three classes, trees, plants of 'herbaceous'¹¹ character, and

⁹ οὐ καὶ συμφέρειν conj. Sch.; οὐ καὶ συμφέρει Ald.; U has συμφέρειν.

¹⁰ cf. C.P. 2. 5. 5, where Androsthenes, one of Alexander's admirals, is given as the authority for this statement.

¹¹ The term τὰ ποιάδη seems to be given here a narrower connotation than usual, in order that τὰ λοχμάδη may be distinguished.

THEOPHRASTUS

ῶσπερ ποιώδη τὰ δὲ λοχμώδη. λέγω δὲ ποιώδη μὲν οἷον τὸ σέλινον τὸ ἔλειον καὶ ὅσα ἄλλα τοι-
αῦτα· λοχμώδη δὲ κάλαμον κύπειρον φλεὼ σχοῖ-
νον βούτομον, ἅπερ σχεδὸν κοινὰ πάντων τῶν
ποταμῶν καὶ τῶν τοιούτων τόπων.

Ἐνιαχοῦ δὲ καὶ βάτοι καὶ παλίουροι καὶ τὰ
ἄλλα δένδρα, καθάπερ ἵτεα λεύκη πλάτανος. τὰ
μὲν οὖν μέχρι τοῦ κατακρύπτεσθαι, τὰ δὲ ὥστε
μικρὸν ὑπερέχειν, τῶν δὲ αἱ μὲν ρίζαι καὶ μικρὸν
τοῦ στελέχους ἐν τῷ ὑγρῷ, τὸ δὲ ἄλλο σῶμα πᾶν
ἔξω. τοῦτο γάρ καὶ ἵτεα καὶ κλήθρα καὶ πλατάνῳ
καὶ φιλύρα καὶ πᾶσι τοῖς φιλύδροις συμβαίνει.

2 Σχεδὸν δὲ καὶ ταῦτα κοινὰ πάντων τῶν ποτα-
μῶν ἔστιν¹ ἐπεὶ καὶ ἐν τῷ Νείλῳ πέφυκεν¹ οὐ
μὴν πολλή γε ἡ πλάτανος, ἀλλὰ σπανιωτέρα ἔτι
ταύτης ἡ λεύκη, πλείστη δὲ μελία καὶ βουμέλιος.
τῶν γοῦν ἐν Αἰγύπτῳ φυομένων τὸ μὲν ὅλον
πολὺ πλήθος ἔστιν πρὸς τὸ ἀριθμήσασθαι καθ'
ἔκαστον¹ οὐ μὴν ἀλλ' ὡς γε ἀπλῶς εἰπεῖν ἅπαντα
ἔδωδιμα καὶ χυλοὺς ἔχοντα γλυκεῖς. διαφέρειν
δὲ δοκεῖ τῇ γλυκύτητι καὶ τῷ τρόφῳ μάλιστα
είναι τρία ταῦτα, ὅ τε πάπυρος καὶ τὸ καλού-
μενον σάρι καὶ τρίτον δι μνάσιον καλοῦσι.

3 Φύεται δὲ ὁ πάπυρος οὐκ ἐν βάθει τοῦ ὕδατος
ἄλλ' ὅσον ἐν δύο πήχεσιν, ἐνιαχοῦ δὲ καὶ ἐν
ἔλάττονι. πάχος μὲν οὖν τῆς ρίζης ἡλίκον καρ-
πὸς χειρὸς ἀνδρὸς εὐρώστου, μῆκος δὲ ὑπὲρ τε-
τράπηχν¹ φύεται δὲ ὑπὲρ τῆς γῆς αὐτῆς, πλαγίας
ρίζας εἰς τὸν πηλὸν καθιεῖσα λεπτὰς καὶ πυκνάς,
ἄνω δὲ τοὺς παπύρους καλουμένους τριγώνους,

¹ τῶν γοῦν κ.τ.λ.: text probably defective; what follows
appears to relate to τὰ ποιώδη.

ENQUIRY INTO PLANTS, IV. VIII. 1-3

plants growing in clumps. By 'herbaceous' I mean here such plants as the marsh celery and the like; by 'plants growing in clumps' I mean reeds galangale *phleo* rush sedge—which are common to almost all rivers and such situations.

And in some such places are found brambles Christ's thorn and other trees, such as willow abele plane. Some of these are water plants to the extent of being submerged, while some project a little from the water; of some again the roots and a small part of the stem are under water, but the rest of the body is altogether above it. This is the case with willow alder plane lime, and all water-loving trees.

These too are common to almost all rivers, for they grow even in the Nile. However the plane is not abundant by rivers, while the abele is even more scarce, and the manna-ash and ash are commonest. At any rate of those¹ that grow in Egypt the list is too long to enumerate separately; however, to speak generally, they are all edible and have sweet flavours. But they differ in sweetness, and we may distinguish also three as the most useful for food, namely the papyrus, the plant called *sari*, and the plant which they call *mnasion*.

² The papyrus does not grow in deep water, but only in a depth of about two cubits, and sometimes shallower. The thickness of the root is that of the wrist of a stalwart man, and the length above four cubits³; it grows above the ground itself, throwing down slender matted roots into the mud, and producing above the stalks which give it its name 'papyrus'; these are three-cornered and about ten

² Plin. 13. 71-73.

³ τετράπηχυ: δέκα πήχεις MSS. See next note.

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μέγεθος ὡς δέκα πήχεις, κόμην ἔχοντας ἀχρεῖον ἀσθενῆ καρπὸν δὲ ὅλως οὐδένα· τούτους δ' ἀναδί-
4 δωσι κατὰ πολλὰ μέρη. χρῶνται δὲ ταῖς μὲν ρίζαις ἀντὶ ξύλων οὐ μόνον τῷ κάειν ἀλλὰ καὶ τῷ σκεύη ἀλλα ποιεῦν ἐξ αὐτῶν παντοδαπά· πολὺ γὰρ ἔχει τὸ ξύλον καὶ καλόν. αὐτὸς δὲ ὁ πά- πυρος πρὸς πλεῖστα χρήσιμος· καὶ γὰρ πλοῖα ποιοῦσιν ἐξ αὐτοῦ, καὶ ἐκ τῆς βίβλου ίστια τε πλέκουσι καὶ ψιάθους καὶ ἐσθῆτά τινα καὶ στρωμνὰς καὶ σχοινία τε καὶ ἔτερα πλείω. καὶ ἐμφανέστατα δὴ τοῖς ἔξω τὰ βιβλία· μάλιστα δὲ καὶ πλείστη βοήθεια πρὸς τὴν τροφὴν ἀπ' αὐτοῦ γίνεται. μασῶνται γὰρ ἅπαντες οἱ ἐν τῇ χώρᾳ τὸν πάπυρον καὶ ὡμὸν καὶ ἐφθὸν καὶ ὀπτόν· καὶ τὸν μὲν χυλὸν καταπίνουσι, τὸ δὲ μάσημα ἐκβάλλουσιν. ὁ μὲν οὖν πάπυρος τοιοῦτος τε καὶ ταύτας παρέχεται τὰς χρείας. γίνεται δὲ καὶ ἐν Συρίᾳ περὶ τὴν λίμνην ἐν ἥ καὶ ὁ κάλαμος ὁ εὐώδης· ὅθεν καὶ Ἀντίγονος εἰς τὰς ναῦς ἐποιεῖτο τὰ σχοινία.
5 Τὸ δὲ σάρι φύεται μὲν ἐν τῷ ὕδατι περὶ τὰ ἔλη καὶ τὰ πεδία, ἐπειδὴν ὁ ποταμὸς ἀπέλθῃ, ρίζαν δὲ ἔχει σκληρὰν καὶ συνεστραμμένην, καὶ ἐξ αὐτῆς φύεται τὰ σαρία καλούμενα· ταῦτα δὲ μῆκος μὲν ὡς δύο πήχεις, πάχος δὲ ἡλίκον ὁ δάκτυλος ὁ μέγας τῆς χειρός· τρίγωνον δὲ καὶ τοῦτο, καθάπερ ὁ πάπυρος, καὶ κομην ἔχον παραπλήσιον. μα- σώμενοι δὲ ἐκβάλλουσι καὶ τοῦτο τὸ μάσημα, τῇ ρίζῃ δὲ οἱ σιδηρουργοὶ χρῶνται· τὸν γὰρ ἄνθρακα ποιεῖ χρηστὸν διὰ τὸ σκληρὸν εἶναι τὸ ξύλον.
6 Τὸ δὲ μνάσιον ποιῶδες ἐστιν, ὥστ' οὐδεμίαν παρέχεται χρείαν πλὴν τὴν εἰς τροφήν.

cubits¹ long, having a plume which is useless and weak, and no fruit whatever; and these stalks the plant sends up at many points. They use the roots instead of wood, not only for burning, but also for making a great variety of articles; for the wood is abundant and good. The 'papyrus' itself² is useful for many purposes; for they make boats from it, and from the rind they weave sails mats a kind of raiment coverlets ropes and many other things. Most familiar to foreigners are the papyrus-rolls made of it; but above all the plant also is of very great use in the way of food.³ For all the natives chew the papyrus both raw boiled and roasted; they swallow the juice and spit out the quid. Such is the papyrus and such its uses. It grows also in Syria about the lake in which grows also sweet-flag; and Antigonus made of it the cables for his ships.

⁴ The *sari* grows in the water in marshes and plains, when the river has left them; it has a hard twisted root, and from it grow what they call the *saria*⁵; these are about two cubits long and as thick as a man's thumb; this stalk too is three-cornered, like the papyrus, and has similar foliage. This also they chew, spitting out the quid; and smiths use the root, for it makes excellent charcoal, because the wood is hard.

Mnasion is herbaceous, so that it has no use except for food.

¹ δέκα πήχεις: τετραπήχεις MSS. The two numbers seem to have changed places (Bartels ap. Sch.). cf. Plin. *l.c.*

² i.e. the stalk.

³ cf. Diod. 1. 80.

⁴ Plin. 13. 128.

⁵ i.e. stalks, like those of the papyrus.

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Καὶ τὰ μὲν γλυκύτητι διαφέροντα ταῦτα ἔστι. φύεται δὲ καὶ ἔτερον ἐν τοῖς ἔλεσι καὶ ταῖς λίμναις δὲ οὐ συνάπτει τῇ γῇ, τὴν μὲν φύσιν ὅμοιον τοῖς κρίνοις, πολυφυλλότερον δὲ καὶ παρ' ἄλληλα τὰ φύλλα καθάπερ ἐν διστοιχίᾳ· χρῶμα δὲ χλωρὸν ἔχει σφόδρα. χρῶνται δὲ οἱ ἰατροὶ πρὸς τε τὰ γυναικεῖα αὐτῷ καὶ πρὸς τὰ κατάγματα.

7 [Ταῦτα δὲ γίνεται ἐν τῷ ποταμῷ εἰ μὴ ὁ ρόνις ἔξεφερεν· συμβαίνει δὲ ὥστε καὶ ἀποφέρεσθαι· ἔτερα δ' ἀπ' αὐτῶν πλείω.]

Ο δὲ κύαμος φύεται μὲν ἐν τοῖς ἔλεσι καὶ λίμναις, καυλὸς δὲ αὐτοῦ μῆκος μὲν ὁ μακρότατος εἰς τέτταρας πήχεις, πάχος δὲ δακτυλιαῖος, ὅμοιος δὲ καλάμῳ μαλακῷ ἀγονάτῳ. διαφύσεις δὲ ἔνδοθεν ἔχει διὰ ὅλου διειλημμένας ὄμοίας τοῖς κηρίοις· ἐπὶ τούτῳ δὲ ἡ κωδύα, παρομοία σφηκίῳ περιφερεῖ, καὶ ἐν ἐκάστῳ τῶν κυττάρων κύαμος μικρὸν ὑπεραίρων αὐτῆς, πλῆθος δὲ οἱ πλεῖστοι τριάκοντα. τὸ δὲ ἄνθος διπλάσιον ἡ μήκωνος, χρῶμα δὲ ὅμοιον ρόδῳ κατακορές· ἐπάνω δὲ τοῦ ὕδατος ἡ κωδύα. παραφύεται δὲ φύλλα μεγάλα παρ' ἐκαστον τῶν κυάμων, ὡν ἵσα τὰ μεγέθη πετάσῳ Θετταλικῇ τὸν αὐτὸν ἔχοντα καυλὸν τῷ τῶν κυάμων. συντρίψαντι δ' ἐκαστον τῶν κυάμων φανερόν ἔστι τὸ πικρὸν συνεστραμμένον, ἔξ

¹ *Ottelia alismoides*. See Index App. (18).

² ταῦτα . . . πλείω conj. W. after Sch.; I have also transposed the two sentences, after Sch. The whole passage in [] (which is omitted by G) is apparently either an interpolation or defective. σημαίνει δὲ ὥσπερ καὶ ἀποφέρεσθαι· ἔτερα δὲ ἀπ' αὐτῶν τὰ πλεία· ταῦτα δὲ γίνεται ἐν τῷ ποταμῷ· εἰ μὴ δὲ ρόνις ἔξεφερεν Ald.; so also U, but αὐτῶν πλείω.

ENQUIRY INTO PLANTS, IV. viii. 6-7

Such are the plants which excel in sweetness of taste. There is also another plant¹ which grows in the marshes and lakes, but which does not take hold of the ground; in character it is like a lily, but it is more leafy, and has its leaves opposite to one another, as it were in a double row; the colour is a deep green. Physicians use it for the complaints of women and for fractures.

Now these plants grow in the river, unless the stream has thrown them up on land; it sometimes happens that they are borne down the stream, and that then other plants grow from them.²

³ But the 'Egyptian bean' grows in the marshes and lakes; the length of its stalk at longest is four cubits, it is as thick as a man's finger, and resembles a pliant⁴ reed without joints. Inside it has tubes which run distinct from one another right through, like a honey-comb: on this is set the 'head,' which is like a round wasps' nest, and in each of the cells is a 'bean,' which slightly projects from it; at most there are thirty of these. The flower is twice as large as a poppy's, and the colour is like a rose, of a deep shade; the 'head' is above the water. Large leaves grow at the side of each plant, equal⁵ in size to a Thessalian hat⁶; these have a stalk exactly like that⁷ of the plant. If one of the 'beans' is crushed, you find the bitter substance coiled up, of which the

³ Plin. 18. 121 and 122.

⁴ μαλακῷ Ald. H. G Plin. l.c. Athen. 3. 2 cites the passage with μακρῷ.

⁵ ίσα conj. W.; καλ Ald.

⁶ πετάσῳ conj. Sch. from Diosc. 2. 106; πίλῳ Ald. H.; οἱ πέτασοι are mentioned below (§ 9) without explanation. The comparison is omitted by G and Plin. l.c.

⁷ i.e. that which carries the καδύα.

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8 οὐ γίνεται ὁ πῖλος. τὰ μὲν οὖν περὶ τὸν καρπὸν τοιαῦτα. ἡ δὲ ρίζα παχυτέρα τοῦ καλάμου τοῦ παχυτάτου καὶ διαφύσεις ὁμοίως ἔχουσα τῷ καυλῷ. ἐσθίουσι δ' αὐτὴν καὶ ὡμὴν καὶ ἐφθῆν καὶ ὅπτιν, καὶ οἱ περὶ τὰ ἔλη τούτῳ σίτῳ χρῶνται. φύεται μὲν οὖν ὁ πολὺς αὐτόματος· οὐ μὴν ἀλλὰ καὶ καταβάλλουσιν ἐν πηλῷ ἀχυρώσαντες εὖ μάλα πρὸς τὸ κατενεχθῆναι τε καὶ μεῖναι καὶ μὴ διαφθαρῆναι· καὶ οὕτω κατασκευάζουσι τοὺς κυαμῶνας· ἀν δὲ ἄπαξ ἀντιλάβηται, μένει διὰ τέλους. ἴσχυρὰ γάρ ἡ ρίζα καὶ οὐ πόρρω τῆς τῶν καλάμων πλὴν ἐπακανθίζουσα· δι' ὃ καὶ ὁ κροκόδειλος φεύγει μὴ προσκόψη τῷ ὀφθαλμῷ τῷ μὴ ὁξὺ καθορᾶν· γίνεται δὲ οὕτος καὶ ἐν Συρίᾳ καὶ κατὰ Κιλικίαν, ἀλλ' οὐκ ἐκπέττουσιν αἱ χῶραι· καὶ περὶ Τορώνην τῆς Χαλκιδικῆς ἐν λίμνῃ τινὶ μετρίᾳ τῷ μεγέθει· καὶ αὐτοῦ πέττεται τελέως καὶ τελεοκαρπεῖ.

9 'Ο δὲ λωτὸς καλούμενος φύεται μὲν ὁ πλεῖστος ἐν τοῖς πεδίοις, ὅταν ἡ χώρα κατακλυσθῇ. τούτου δὲ ἡ μὲν τοῦ καυλοῦ φύσις ὁμοία τῇ τοῦ κυάμου, καὶ οἱ πέτασοι δὲ ὡσαύτως, πλὴν ἐλάττους καὶ λεπτότεροι. ἐπιφύεται δὲ ὁμοίως ὁ καρπὸς τῷ τοῦ κυάμου. τὸ ἄνθος αὐτοῦ λευκὸν ἐμφερὲς τῇ στενότητι τῶν φύλλων τοῖς τοῦ κρίνου, πολλὰ δὲ καὶ πυκνὰ ἐπ' ἀλλήλοις φύεται. ταῦτα δὲ ὅταν μὲν ὁ ἥλιος δύη συμμέει καὶ συγκαλύπτει τὴν κωδύναν, ἄμα δὲ τῇ ἀνατολῇ διοί-

¹ δ πῖλος UMV; ἡ πῖλος Ald.H.; ?=germen Sch.

² cf. Diosc. 2. 107.

³ καὶ καταβ. conj. W.; καταβ. Ald.; καταβ. δ' UMV.

⁴ Plin. 13. 107 and 108.

ENQUIRY INTO PLANTS, IV. viii. 7-9

*pilos*¹ is made. So much for the fruit. The root is thicker than the thickest reed, and is made up of distinct tubes, like the stalk.² They eat it both raw boiled and roasted, and the people of the marshes make this their food. It mostly grows of its own accord; however they also sow³ it in the mud, having first well mixed the seed with chaff, so that it may be carried down and remain in the ground without being rotted; and so they prepare the 'bean' fields, and if the plant once takes hold it is permanent. For the root is strong and not unlike that of reeds, except that it is prickly on the surface. Wherefore the crocodile avoids it, lest he may strike his eye on it, since he has not sharp sight. This plant also grows in Syria and in parts of Cilicia, but these countries cannot ripen it; also about Torone in Chalcidice in a certain lake of small size; and this lake ripens it perfectly and matures its fruit.

⁴ The plant called the *lotos* (Nile water-lily) grows chiefly in the plains when the land is inundated. The character of the stalk of this plant is like that of the 'Egyptian bean,' and so are the 'hat-like' leaves,⁵ except that they are smaller and slenderer. And the fruit⁶ grows on the stalk in the same way as that of the 'bean.' The flower is white, resembling in the narrowness of its petals those of the lily,⁷ but there are many petals growing close one upon another. When the sun sets, these close⁸ and cover up the 'head,' but with sunrise they open and

¹ cf. 4. 8. 7.

² καρπὸς conj. W.; λωτὸς MSS. Possibly the fruit was specially called λωτός.

³ cf. Hdt. 2. 92; Diosc. 4. 113.

⁴ δέη, συμμέει conj. St.; συμμέει MV; συμμένη U; συμμένη (omitting καλ) Ald. H.

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γεται και ὑπὲρ τοῦ ὄδατος γίνεται. τοῦτο δὲ ποιεῖ μέχρι ἀν ἡ κωδύα ἐκτελεωθῆ καὶ τὰ ἄνθη 10 περιρρυῆ. τῆς δὲ κωδύας τὸ μέγεθος ἡλίκον μήκωνος τῆς μεγίστης, καὶ διέζωσται ταῖς κατατομαῖς τὸν αὐτὸν τρόπον τῇ μήκωνι· πλὴν πυκνοτερος ἐν ταύταις ὁ καρπός. ἔστι δὲ παρόμοιος τῷ κέγχρῳ. ἐν δὲ τῷ Εὐφράτῃ τὴν κωδύαν φασὶ καὶ τὰ ἄνθη δύνειν καὶ ὑποκαταβαίνειν τῆς ὄψιας μέχρι μεσῶν νυκτῶν καὶ τῷ βάθει πόρρω· οὐδὲ γὰρ καθιέντα τὴν χεῖρα λαβεῖν εἶναι. μετὰ δὲ ταῦτα ὅταν ὅρθρος ἡ πάλιν ἐπανιέναι καὶ πρὸς ἡμέραν ἔτι μᾶλλον, ἅμα τῷ ἡλίῳ φανερὸν <ὄν> ὑπὲρ τοῦ ὄδατος καὶ ἀνοίγειν τὸ ἄνθος, ἀνοιχθέντος δὲ ἔτι ἀναβαίνειν· συχνὸν δὲ τὸ ὑπεραῖρον 11 εἶναι τὸ ὄδωρ. τὰς δὲ κωδύας ταύτας οἱ Αἰγύπτιοι συνθέντες εἰς τὸ αὐτὸ σήπουσιν· ἐπὰν δὲ σαπῆ τὸ κέλυφος, ἐν τῷ ποταμῷ κλύζοντες ἔξαιροῦσι τὸν καρπόν, ξηράναντες δὲ καὶ πτίσαντες ἄρτους ποιοῦσι καὶ τούτῳ χρῶνται σιτίῳ. ἡ δὲ ρίζα τοῦ λωτοῦ κυλεῖται μὲν κόρσιον, ἔστι δὲ στρογγύλη, τὸ μέγεθος ἡλίκον μῆλον Κυδώνιον· φλοιὸς δὲ περίκειται περὶ αὐτὴν μέλας ἐμφερῆς τῷ κασταναικῷ καρύῳ· τὸ δὲ ἐντὸς λευκόν, ἐψόμενον δὲ καὶ ὀπτώμενον γίνεται λεκιθῶδες, ἡδὺ δὲ ἐν τῇ προσφορᾷ· ἔσθιεται δὲ καὶ ωμή, ἀρίστη δὲ ἐν [τῷ] ὄδατι ἐφθῆ καὶ ὀπτή. καὶ τὰ μὲν ἐν τοῖς ὄδασιν σχεδὸν ταῦτα ἔστιν.

12 'Ἐν δὲ τοῖς ἀμμώδεσι χωρίοις, ἡ ἔστιν οὐ πόρρω

¹ cf. Diosc. l.c. ² cf. C.P. 2. 19. 1; Plin. 13. 109.

³ ὄψιας conj. W. from Plin. l.c.; ? ὄψιας ὄρας.

⁴ <ὄν> add. W.

⁵ κέλυφος i.e. fruit: καρπόν i.e. seeds.

appear above the water. This the plant does until the 'head' is matured and the flowers have fallen off.
¹ The size of the 'head' is that of the largest poppy, and it has grooves all round it in the same way as the poppy, but the fruit is set closer in these. This is like millet. ² In the Euphrates they say that the 'head' and the flowers sink and go under water in the evening ³ till midnight, and sink to a considerable depth; for one can not even reach them by plunging one's hand in; and that after this, when dawn comes round, they rise and go on rising towards day-break, being ⁴ visible above the water when the sun appears; and that then the plant opens its flower, and, after it is open, it still rises; and that it is a considerable part which projects above the water. These 'heads' the Egyptians heap together and leave to decay, and when the 'pod' ⁵ has decayed, they wash the 'head' in the river and take out the 'fruit,' ⁵ and, having dried and pounded ⁶ it, they make loaves of it, which they use for food. The root of the *lotos* is called *korsion*,⁷ and it is round and about the size of a quince; it is enclosed in a black 'bark,' like the shell of a chestnut. The inside is white; but when it is boiled or roasted, it becomes of the colour of the yolk of an egg and is sweet to taste. The root is also eaten raw, though it is best when boiled in water or roasted.⁸ Such are the plants found in water.

In sandy places which are not ⁹ far from the river

⁶ πτίσαντες: cf. Hdt. 2. 92. ⁷ cf. Strabo 17. 2. 4.

⁸ ἔσθεται . . . ὀπτή conj. Sch. from Plin. l.c. and G; ἔσθ. δὲ καὶ ὡμόν. ἀρίστη δὲ ἐν τοῖς ὅδασιν αὐτῇ ὡμή Ald.; ἀρίστη δὲ καὶ τοῖς ὅδασιν αὐτὴν UΜV, then ομή U, ὡμή V, ὡμή M; ἀρίστη δὲ ἐν τῷ ὅδατι ἔφθῃ ή καὶ ὀπτή H.

⁹ οὐ was apparently not in Pliny's text; (21. 88.)

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τοῦ ποταμοῦ, φύεται κατὰ γῆς δὲ καλεῖται μαλιν-
αθάλλη, στρογγύλον τῷ σχήματι μέγεθος δὲ
ήλικον μέσπιλον ἀπύρηνον δὲ ἄφλοιον· φύλλα
δὲ ἀφίησιν ἀπ' αὐτοῦ ὅμοια κυπείρω· ταῦτα
συνάγοντες οἱ κατὰ τὴν χώραν ἔφουσιν ἐν βρυτῷ
τῷ ἀπὸ τῶν κριθῶν καὶ γίνεται γλυκέα σφόδρα·
χρῶνται δὲ πάντες ὥσπερ τραγήμασι.

13 Τοῖς δὲ βουσὶ καὶ τοῖς προβάτοις ἄπαντα μὲν
τὰ φυόμενα ἐδώδιμά ἐστιν, ἐν δέ τι γένος ἐν ταῖς
λίμναις καὶ τοῖς ἔλεσι φύεται διαφέρον, δὲ καὶ
χλωρὸν νέμονται καὶ ξηράνοντες παρέχουσι κατὰ
χειμῶνα τοῖς βουσὶν ὅταν ἐργάσωνται· καὶ τὰ
σώματα ἔχουσιν εὖ σίτου ἄλλο λαμβάνοντες
οὐθέν.

14 Ἐστι δὲ καὶ ἄλλο παραφυόμενον αὐτόματον
ἐν τῷ σίτῳ· τοῦτο δέ, ὅταν ὁ σίτος ἡ καθαρός,
ὑποπτίσαντες καταβάλλουσι τοῦ χειμῶνος ὑγ-
ρὰν εἰς γῆν· βλαστήσαντος δὲ τεμόντες καὶ
ξηράναντες παρέχουσι καὶ τοῦτο βουσὶ καὶ
ἴπποις καὶ τοῖς ὑποξυγίοις σὺν τῷ καρπῷ τῷ ἐπι-
γινομένῳ· ὁ δὲ καρπὸς μέγεθος μὲν ἡλίκον σή-
σαμον, στρογγύλος δὲ καὶ τῷ χρώματι χλωρός,
ἀγαθὸς δὲ διαφερόντως. ἐν Αἰγύπτῳ μὲν οὖν
τὰ περιττὰ σχεδὸν ταῦτα ἄν τις λάβοι.

IX. Ἔκαστοι δὲ τῶν ποταμῶν ἐοίκασιν ἴδιόν
τι φέρειν, ὥσπερ καὶ τῶν χερσαίων. ἐπεὶ οὐδὲ
ὁ τρίβολος ἐν ἄπασιν οὐδὲ πανταχοῦ φύεται,
ἀλλ ἐν τοῖς ἐλώδεσι τῶν ποταμῶν ἐν μεγίστῳ
δὲ βάθει πενταπήχει ἡ μικρῷ μείζονι, καθάπερ

¹ Plin. *l.c. anthalium*, whence Salm. conj. ἀνθάλλιον.

² *Saccharum biflorum*. See Index App. (19).

³ εὖ σίτου ἄλλο conj. W.; εὐσίτοῦντα Ald.

ENQUIRY INTO PLANTS, IV. VIII. 12-IX. 1

there grows under ground the thing called *malinathalle*¹; this is round in shape and as large as a medlar, but has no stone and no bark. It sends out leaves like those of galingale. These the people of the country collect and boil in beer made from barley, and they become extremely sweet, and all men use them as sweetmeats.

All the things that grow in such places may be eaten by oxen and sheep, but there is one kind of plant² which grows in the lakes and marshes which is specially good for food: they graze their cattle on it when it is green, and also dry it and give it in the winter to the oxen after their work; and these keep in good condition when they have no other³ kind of food.

There is also another plant⁴ which comes up of its own accord among the corn; this, when the harvest is cleared, they crush slightly⁵ and lay during the winter on⁶ moist ground; when it shoots, they cut and dry it and give this also to the cattle and horses and beasts of burden with the fruit which forms on it. The fruit in size is as large as sesame, but round and green in colour, and exceedingly good. Such one might take to be specially remarkable plants of Egypt.

IX. Every river seems to bear some peculiar plant, just as does each part of the dry land.⁷ For not even the water-chestnut grows in all rivers nor everywhere, but only in marshy rivers, and only in those whose depth is not more or not much more than five cubits,

¹ *Corchorus trilocularis*. See Index App. (20).

² G seems to have read ὑποστήσαντες (*leviter pinsentes*); ὑποστήσαντες W. with Ald. H.

³ εἰς conj. W.; τὴν Ald.

⁷ Plin. 21. 98; Diosc. 4. 15.

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περὶ τὸν Στρυμόνα· σχεδὸν δὲ ἐν τοσούτῳ καὶ
ό κάλαμος καὶ τὰ ἄλλα. ὑπερέχει δὲ οὐθὲν
αὐτοῦ πλὴν αὐτὰ τὰ φύλλα ὥσπερ ἐπινέοντα
καὶ κρύπτοντα τὸν τρίβολον, ὁ δὲ τριβόλος αὐτὸς
ἐν τῷ ὕδατι νεύων εἰς βιθόν. τὸ δὲ φύλλον ἐστὶ¹
πλατὺ προσεμφερὲς τῷ τῆς πτελέας, μίσχον δὲ
ἔχει σφόδρα μακρόν· ὁ δὲ καυλὸς ἐξ ἄκρου
παχύτατος, ὅθεν τὰ φύλλα καὶ ὁ καρπός, τὰ
δὲ κάτω λεπτότερος ἀεὶ μέχρι τῆς ρίζης· ἔχει
δὲ ἀποπεφυκότα ἀπ' αὐτοῦ τριχώδη τὰ μὲν
πλεῖστα παράλληλα τὰ δὲ καὶ παραλλάττοντα,
κάτωθεν ἀπὸ τῆς ρίζης μεγάλα τὰ δὲ ἄνω ἀεὶ ἐλάτ-
τω προϊούσιν, ὥστε τὰ τελευταῖα μικρὰ πάμπαν
είναι καὶ τὴν διαφορὰν μεγάλην τὴν ἀπὸ τῆς
ρίζης πρὸς τὸν καρπόν. ἔχει δὲ ἐκ τοῦ ἐνὸς
καυλοῦ καὶ παραβλαστήματα πλείω· καὶ γὰρ
τρία καὶ τέτταρα, μέγιστον δ' αἰεὶ τὸ πλησιαί-
τερον τῆς ρίζης, είτα τὸ μετὰ τοῦτο καὶ τὰ
ἄλλα κατὰ λόγον. τὸ δὲ παραβλαστήματα ἐστιν
ώσπερ καυλὸς ἄλλος λεπτότερος μὲν τοῦ πρώτου,
τὰ δὲ φύλλα καὶ τὸν καρπὸν ἔχων ὁμοίως. ὁ
δὲ καρπὸς μέλας καὶ σκληρὸς σφόδρα. ρίζαν
δὲ ἡλίκην καὶ ποίαν ἔχει σκεπτέον. ἡ μὲν οὖν
φύσις τοιαύτη. φύεται μὲν ἀπὸ τοῦ καρποῦ
τοῦ πίπτοντος καὶ ἀφίησι βλαστὸν τοῦ ἥρος·
3 φασὶ δὲ οἱ μὲν είναι ἐπέτειον οἱ δὲ διαμένειν
τὴν μὲν ρίζαν εἰς χρόνον, ἐξ ἣς καὶ τὴν βλά-
στησιν είναι τοῦ καυλοῦ. τοῦτο μὲν οὖν σκε-
πτέον. ἴδιον δὲ παρὰ τάλλα τὸ τῶν παραφυομένων
ἐκ τοῦ καυλοῦ τριχωδῶν οὔτε γὰρ φύλλα ταῦτα
οὔτε καυλός· ἐπεὶ τό γε τῆς παραβλαστήσεως
κοινὸν καλάμου καὶ ἄλλων.

ENQUIRY INTO PLANTS, IV. ix. 1-3

as the Strymon. (In rivers of such a depth grow also reeds and other plants.) No part of it projects from the water except just the leaves ; these float as it were and conceal the 'chestnut,' which is itself under water and bends down towards the bottom. The leaf is broad, like that of the elm, and has a very long stalk. The stem is thickest at the top, whence spring the leaves and the fruit ; below it gets thinner down to the root. It has springing from it hair-like growths, most of which are parallel to each other, but some are irregular ; below, starting from the root, they are large, but, as one gets higher up the plant, they become smaller, so that those at the top are quite small and there is a great contrast between the root and the top where the fruit grows. The plant also has on the same stalk several side-growths ; of these there are three or four, and the largest is always that which is nearer to the root, the next largest is the one next above it, and so on in proportion : this sidegrowth is like another stalk, but slenderer than the original one, though like that it has leaves and fruit. The fruit is black and extremely hard. The size and character of the root are matter for further enquiry. Such is the character of this plant. It grows from the fruit which falls, and begins to grow in spring. Some say that it is annual, others that the root persists for a time, and that from it grows the new stalk. This then is matter for enquiry. However quite peculiar to this plant is the hair-like character of the growths which spring from the stalk ; for these are neither leaves nor stalk ; though reeds and other things have also sidegrowths.

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Χ. Τὰ μὲν οὖν ἴδια θεωρητέον ἴδιως δῆλον ὅτι, τὰ δὲ κοινὰ κοινῶς. διαιρεῖν δὲ χρὴ καὶ ταῦτα κατὰ τὸν τόπους, οἷον εἰ τὰ μὲν ἔλεια τὰ δὲ λιμναῖα τὰ δὲ ποτάμια μᾶλλον ἢ καὶ κοινὰ πάντων τῶν τόπων διαιρεῖν δὲ καὶ ποῖα ταῦτα ἐν τῷ ὑγρῷ καὶ τῷ ἔηρῳ φύεται, καὶ ποῖα ἐν τῷ ὑγρῷ μόνον, ὡς ἀπλῶς εἰπεῖν πρὸς τὰ κοινότατα εἰρημένα πρότερον.

Ἐν δὲ οὖν τῇ λίμνῃ τῇ περὶ Ὀρχομενὸν τάδε ἐστὶ τὰ φυόμενα δένδρα καὶ ὄληματα, ἵτεα ἐλαίαγνος σίδη κάλαμος ὁ τε αὐλητικὸς καὶ ὁ ἔτερος κύπειρον φλεὼς τύφη, ἔτι γε μήνανθος ἵκμη καὶ τὸ καλούμενον ἵπνον. ὃ γὰρ προσαγορεύουσι λέμνα τούτου τὰ πλείω καθ' ὄδατός ἐστι.

2 Τούτων δὲ τὰ μὲν ἄλλα γνώριμα· ὁ δὲ ἐλαίαγνος καὶ ἡ σίδη καὶ ἡ μήνανθος καὶ ἡ ἵκμη καὶ τὸ ἵπνον ἵσως μὲν φύεται καὶ ἐτέρωθι, προσαγορεύεται δὲ ἄλλοις ὀνόμασι· λεκτέον δὲ περὶ αὐτῶν. ἔστι δὲ ὁ μὲν ἐλαίαγνος φύσει μὲν θαμνῶδες καὶ παρόμοιον τοῖς ἄγνοις, φύλλον δὲ ἔχει τῷ μὲν σχήματι παραπλήσιον μαλακὸν δέ, ὥσπερ αἱ μηλέαι καὶ χνοῶδες. ἄνθος δὲ τῷ τῆς λεύκης ὅμοιον ἔλαττον· καρπὸν δὲ οὐδένα φέρει. φύεται δὲ ὁ πλεῖστος μὲν ἐπὶ τῶν πλοαδῶν νήσων· εἰσὶ γάρ τινες καὶ ἐνταῦθα πλοαδεῖς, ὥσπερ ἐν Αἰγύπτῳ

¹ τὰ δὲ κοινὰ κοινῶς conj. Sch. from G ; τὰ δὲ κοινῶς Ald. H.

² ταῦτα conj. Sch.; ταῦτα Ald.

³ πρὸς τὰ κοιν. εἰρ. πρ. conj. W. supported by G ; κοινότατα προσειρημένα πρότερον Ald. H.

ENQUIRY INTO PLANTS, IV. x. 1-2

Of the plants peculiar to the lake of Orchomenos (Lake Copais), especially its reeds; and of reeds in general.

X. Plants peculiar to particular places must be considered separately, while a general account may be given of those which are generally distributed.¹ But even the latter must be classified according to locality; thus some belong to marshes, others to lakes, others to rivers, or again others may be common to all kinds of locality: we must also distinguish which occur alike² in wet and in dry ground, and which only in wet ground, marking these off in a general way from those mentioned above as being most impartial.³

Now in the lake near Orchomenos grow the following trees and woody plants: willow goat-willow water-lily reeds (both that used for making pipes and the other kind) galingale *phleos* bulrush; and also 'moon-flower' duckweed and the plant called marestail: as for the plant called water-chickweed the greater part of it grows under water.⁴

Now of these most are familiar: the goat-willow water-lily 'moon-flower' duckweed and marestail probably grow also elsewhere, but are called by different names. Of these we must speak. The goat-willow is of shrubby habit and like the chaste-tree: its leaf resembles that leaf in shape, but it is soft like that of the apple,⁵ and downy. The bloom⁶ is like that of the abele, but smaller, and it bears no fruit. It grows chiefly on the floating islands; (for here too there are floating islands, as in the marshes

⁴ τούτου τὰ πλείω καθ' ὅδ. conj. Sch.; τοῦτο πλείω τὸ καθ' ὅδ. UM; τοῦτο πλεῖον τὸ καθ' ὅδ. Ald.

⁵ μηλέαι perhaps here = quince (μηλέα Κυδωνία).

⁶ ἄνθος here = catkin.

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περὶ τὰ ἔλη καὶ ἐν Θεσπρωτίδι καὶ ἐν ἄλλαις λίμναις· ἐλάττων δὲ καθ' ὕδατος· ὁ μὲν οὖν ἐλαίαγνος τοιοῦτον.

3 Ἡ δὲ σίδη τὴν μὲν μορφήν ἔστιν ὁμοία τῇ μήκων· καὶ γὰρ τὸ ἄνω κυτινῶδες τοιοῦτον ἔχει, πλὴν μεῖζον ὡς κατὰ λόγον· μεγέθει δὲ ὅλος ὁ ὅγκος ἡλίκουν μῆλον· ἔστι δὲ οὐ γυμνόν, ἀλλὰ ὑμένες περὶ αὐτὴν λευκοί, καὶ ἐπὶ τούτοις ἔξωθεν φύλλα ποώδη παραπλήσια τοῖς τῶν ρόδων ὅταν ἐν κάλυξιν ὅσι, τέτταρα τὸν ἀριθμόν· ἀνοιχθεῖσα δὲ τοὺς κόκκους ἐρυθροὺς μὲν ἔχει τῷ σχήματι δὲ οὐχ ὁμοίους ταῖς ροαις ἀλλὰ περιφερεῖς μικροὺς δὲ καὶ οὐ πολλῷ μείζους κέγχρους τὸν δὲ χυλὸν ὕδατώδη τινά, καθάπερ ὁ τῶν πυρῶν. ἀδρυνεται δὲ τοῦ θέρους, μίσχον δὲ ἔχει μακρόν. τὸ δὲ ἄνθος ὅμοιον ρόδου κάλυκι, μεῖζον δὲ καὶ σχεδὸν διπλάσιον τῷ μεγέθει. τοῦτο μὲν οὖν καὶ τὸ φύλλον ἐπὶ τοῦ ὕδατος· μετὰ δὲ ταῦτα, ὅταν ἀπανθήσῃ καὶ συστῆ τὸ περικάρπιον, κατακλίνεσθαι φασιν εἰς τὸ ὕδωρ μᾶλλον, τέλος δὲ συνάπτειν τῇ γῇ καὶ τὸν καρπὸν ἐκχεῖν.

4 Καρποφορεῖν δὲ τῶν ἐν τῇ λίμνῃ τοῦτο καὶ τὸ βούτομον καὶ τὸν φλεών. είναι δὲ τοῦ βουτόμου μέλανα, τῷ δὲ μεγέθει παραπλήσιον τῷ τῆς σίδης. τοῦ δὲ φλεὼ τὴν καλουμένην ἀνθήλην,

¹ ἐλάττων . . . ὕδατος: sense doubtful. G. seems to render a different reading.

² i.e. the flower-head, which, as well as the plant, was called *σίδη*.

³ μήκων can hardly be right: suspected by H.

⁴ cf. Athen. 14. 64.

⁵ i.e. petals.

of Egypt, in Thesprotia, and in other lakes). When it grows under water, it is smaller.¹ Such is the goat-willow.

The water-lily² is in shape like the poppy.³ For the top of it has this character, being shaped like the pomegranate flower,⁴ but it is longer in proportion to the size of the plant. Its size in fact as a whole is that of an apple; but it is not bare, having round it white membranes,⁵ and attached to these on the outside are grass-green 'leaves,'⁶ like those of roses when they are still in bud, and of these there are four; when it is opened it shews its seeds, which are red; in shape however they are not like pomegranate⁷ seeds, but round small and not much longer than millet seeds; the taste is insipid, like that of wheat-grains. It ripens in summer and has a long stalk. The flower is like a rose-bud, but larger, almost twice as large. Now this and the leaf float on the water; but later, when the bloom is over and the fruit-case⁸ has formed, they say that it sinks deeper into the water, and finally reaches the bottom and sheds its fruit.

Of the plants of the lake they say that water-lily sedge and *phleos* bear fruit, and that that of the sedge is black, and in size like that of the water-lily. The fruit of *phleos* is what is called the 'plume,'⁹

⁶ i.e. sepals.

⁷ *ρόαις* conj. Bod. from Nic. *Ther.* 887 and Schol.; *βλέαις* UΜV Ald. H.

⁸ *περικάρπιον* conj. W.; *κατακάρπιον* MSS. *κατα-* probably due to *κατακλίνεσθαι*.

⁹ cf. Diosc. 3. 118. *ἀνθηλην*, sc. *καρκόν* *ελναι*. But Sch. suggests that further description of the fruit has dropped out, and that the clause *φ... κονίας* does not refer to the fruit.

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φέρει τὰς κονίας. τοῦτο δέ ἐστὶν οἷον πλακουντῶδές τι μαλακὸν ἐπίπυρρον. ἔτι δὲ καὶ τοῦ φλεὼ καὶ τοῦ βουτόμου τὸ μὲν θῆλυ ἄκαρπον, χρήσιμον δὲ πρὸς τὰ πλόκανα, τὸ δὲ ἄρρεν ἀχρεῖον.

Περὶ δὲ τῆς ἵκμης καὶ μηνάνθους καὶ τοῦ ἵπνου σκεπτέον.

5 Ἰδιώτατον δὲ τούτων ἐστὶν ἡ τύφη καὶ τῷ ἄφυντον εἶναι καὶ τῷ μὴ πολύρριζον τοῖς ἄλλοις ὁμοίως· ἐπεὶ τάλλα οὐχ ἡττον εἰς τὰ κάτω τὴν ὄρμὴν ἔχει καὶ τὴν δύναμιν μάλιστα δὲ τὸ κύπειρον, ὥσπερ καὶ ἡ ἄγρωστις, δι' ὃ καὶ δυσώλεθρα καὶ ταῦτα καὶ ὅλως ἀπαν τὸ γένος τὸ τοιοῦτον. ἡ δὲ ρίζα τοῦ κυπείρου πολύ τι τῶν ἄλλων παραλλάττει τῇ ἀνωμαλίᾳ, τῷ τὸ μὲν εἶναι παχύ τι καὶ σαρκῶδες αὐτῆς τὸ δὲ λεπτὸν καὶ ξυλῶδες· καὶ τῇ βλαστήσει καὶ τῇ γενέσει· φύεται γὰρ ἀπὸ τοῦ πρεμνώδους ἑτέρα λεπτὴ κατὰ πλάγιον, εἰτ' ἐν ταύτῃ συνίσταται πάλιν τὸ σαρκῶδες, ἐν φέρει τῷ τοιούτῳ τρόπον ρίζας, δι' ὃ καὶ πάντων μάλιστα δυσώλεθρον καὶ ἔργον ἔξελειν.

6 (Σχεδὸν δὲ παραπλησίως φύεται ἡ ἄγρωστις ἐκ τῶν γονάτων· αἱ γὰρ ρίζαι γονατώδεις, ἐξ ἑκάστου δέ ἀφίησιν ἄνω βλαστὸν καὶ κάτωθεν ρίζαν. ὡσαύτως δὲ καὶ ἡ ἄκανθα ἡ ἀκανώδης, ἀλλ' οὐ καλαμώδης οὐδὲ γονατώδης ἡ ρίζα ταύ-

¹ κονίας: ? κονιάσεις (plastering), a conjecture mentioned by Sch.

and it is used as a soap-powder.¹ It is something like a cake, soft and reddish. Moreover the 'female' plant both of *phleos* and sedge is barren, but useful for basket-work,² while the 'male' is useless.

Duckweed 'moon-flower' and marestail require further investigation.

Most peculiar of these plants is the bulrush, both in being leafless and in not having so many roots as the others; for the others tend downwards quite as much as upwards, and shew their strength in that direction; and especially is this true of galingale, and also of dog's-tooth grass; wherefore these plants too and all others like them are hard to destroy. The root of galingale exceeds all the others in the diversity of characters which it shews, in that part of it is stout and fleshy, part slender and woody. So also is this plant peculiar in its way of shooting and originating; for from the trunk-like stock³ grows another slender root⁴ sideways, and on this again forms the fleshy part which contains the shoot from which the stalk springs.⁵ In like manner it also sends out roots downwards; wherefore of all plants it is hardest to kill, and troublesome to get rid of.

(Dog's-tooth grass grows in almost the same way from the joints; for the roots are jointed, and from each joint it sends a shoot upwards and a root downwards. The growth of the spinous plant called corn-thistle⁶ is similar, but it is not reedy and its

¹ cf. Hdt. 3. 98. ³ i.e. rhizome.

⁴ i.e. stolon; cf. 1. 6. 8.

⁵ ἀφ' οὗ δὲ καυλός transposed by W.; in Ald. these words come before ἐν φ.

⁶ ἡ ἀκανάθης I conj.; κεάνων UMV; κεάνωθος Ald.: ἡ κεάνωθος most edd.; G omits the word.

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της. ταῦτα μὲν οὖν ἐπὶ πλεῖον διὰ τὴν ὁμοιότητα εἴρηται.)

Φύεται δ' ἐν ἀμφοῖν καὶ ἐν τῇ γῇ καὶ ἐν τῷ ὕδατι ἵτεα κάλαμος, πλὴν τοῦ αὐλητικοῦ, κύπειρον τύφη φλεὼς βούτομος¹ ἐν δὲ τῷ ὕδατι μόνον σίδη. περὶ γὰρ τῆς τύφης ἀμφισβητοῦσι. καλλίω δὲ καὶ μείζω τῶν ἐν ἀμφοῖν φυομένων αἱὲ τὰ ἐν τῷ ὕδατι γίνεσθαι φασι. φύεσθαι δὲνια τούτων καὶ ἐπὶ τῶν πλοαδῶν, οἷον τὸ κύπειρον καὶ τὸ βούτομον καὶ τὸν φλεών, ὥστε πάντα τὰ μέρη ταῦτα κατέχειν.

⁷ Ἐδώδιμα δ' ἔστὶ τῶν ἐν τῇ λίμνῃ τάδε· ή μὲν σίδη καὶ αὐτὴ καὶ τὰ φύλλα τοῖς προβάτοις, ὁ δὲ βλαστὸς τοῖς ὑσίν, ὁ δὲ καρπὸς τοῖς ἀνθρώποις. τοῦ δὲ φλεὼς καὶ τῆς τύφης καὶ τοῦ βούτομον τὸ πρὸς ταῖς ρίζαις ἀπαλόν, δὲ μάλιστα ἐσθίει τὰ παιδία. ρίζα δὲνδώδιμος ή τοῦ φλεὼς μόνη τοῖς βοσκήμασιν. ὅταν δὲ αὐχμὸς ή καὶ μὴ γένηται τὸ κατὰ κεφαλὴν ὕδωρ, ἀπαντα αὐχμεῖ τὰ ἐν τῇ λίμνῃ, μάλιστα δὲ ὁ κάλαμος, ὑπὲρ οὖν καὶ λοιπὸν εἰπεῖν· ὑπὲρ γὰρ τῶν ἄλλων σχεδὸν εἴρηται.

XI. Τοῦ δὴ καλάμου δύο φασὶν εἶναι γένη, τόν τε αὐλητικὸν καὶ τὸν ἔτερον· ἐν γὰρ εἶναι τὸ γένος τοῦ ἔτερου, διαφέρειν δὲ ἄλλήλων ἵσχυ² *<καὶ παχύτητι>* καὶ λεπτότητι καὶ ἀσθενείᾳ· καλοῦσι δὲ τὸν μὲν ἵσχυρὸν καὶ παχὺν χαρακίαν τὸν δὲ ἔτερον πλόκιμον· καὶ φύεσθαι τὸν μὲν

¹ i.e. we have gone beyond the list of typical plants of Orchomenus given 4. 10. 1, because we have found others of which much the same may be said.

² cf. 4. 10. 2.

³ αὐτὴ: cf. 4. 10. 3 n.

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root is not jointed. We have enlarged on these matters¹ because of the resemblance.)

The willow and the reed (not however the reed used for pipes) galingale bulrush *phleos* sedge grow both on land and in the water, water-lily only in the water. (As to bulrush indeed there is a difference of opinion.) However they say that those plants which grow in the water are always finer and larger than those that grow in both positions; also that some of these plants grow also on the floating islands,² for instance galingale sedge and *phleos*; thus all parts of the lake contain these plants.

Of the plants of the lake the parts good for food are as follows: of the water-lily both the flower³ and the leaves are good for sheep, the young shoots for pigs, and the fruit for men. Of *phleos* galingale and sedge the part next the roots is tender, and is mostly eaten by children. The root of *phleos* is the only part which is edible by cattle. When there is a drought and there is no water from overhead,⁴ all the plants of the lake are dried up, but especially the reed; of this it remains to speak, since we have said almost enough about the rest.

XI.⁵ Of the reed there are said to be two kinds, the one used for making pipes and the other kind. For that of the latter there is only one kind, though individual plants differ in being strong and stout,⁶ or on the other hand slender and weak. The strong stout one they call the 'stake-reed,' the other the 'weaving reed.' The latter they say grows on the

⁴ κεφαλῆν UΜV Ald.; for the case cf. Xen. *Hell.* 7. 2. 8 and 11; κεφαλῆς conj. W.

⁵ Plin. 16. 168 and 169.

⁶ καὶ παχύτητι add. Dalec. from G.

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πλόκιμον ἐπὶ τῶν πλοάδων τὸν δὲ χαρακίαν ἐπὶ τοῖς κώμυσι· κώμυθας δὲ καλοῦσι οὖν ἣ συνηθροισμένος κάλαμος καὶ συμπεπλεγμένος ταῖς ρίζαις· τοῦτο δὲ γίνεται καθ' οὓς ἀν τόπους τῆς λίμνης εὔγειον ἣ χωρίον γίνεσθαι δέ ποτε τὸν χαρακίαν καὶ οὖν ὁ αὐλητικός, μακρότερον μὲν τοῦ ἄλλου χαρακίου σκωληκόβρωτον δέ. τούτου μὲν οὖν ταύτας λέγουσι τὰς διαφοράς.

2 Περὶ δὲ τοῦ αὐλητικοῦ τὸ μὲν φύεσθαι δι' ἐννεατηρίδος, ὥσπερ τινές φασι, καὶ ταύτην εἶναι τὴν τάξιν οὐκ ἀληθές, ἀλλὰ τὸ μὲν ὅλον αὐξηθείσης γίνεται τῆς λίμνης· ὅτι δὲ τοῦτ' ἐδόκει συμβαίνειν ἐν τοῖς πρότερον χρόνοις μάλιστα δι' ἐννεατηρίδος, καὶ τὴν γένεσιν τοῦ καλάμου ταύτην ἐποίουν τὸ συμβεβηκὸς ως τάξιν λαμβάνοντες. γίνεται δὲ ὅταν ἐπομβρίας γενομένης ἐμμένη τὸ ὕδωρ δύ' ἔτη τούλαχιστον, ἀν δὲ πλείω καὶ καλλίων· τούτου δὲ μάλιστα μνημονεύουσι γεγονότος τῶν ὑστερον χρόνων ὅτε συνέβη τὰ περὶ Χαιρώνειαν· πρὸ τούτων γὰρ ἔφασαν ἔτη πλείω βαθυνθῆναι τὴν λίμνην· μετὰ δὲ ταῦτα ὑστερον, ως ὁ λοιμὸς ἐγένετο σφοδρός, πλησθῆναι μὲν αὐτήν, οὐ μείναντος δὲ τοῦ ὕδατος ἀλλ' ἐκλιπόντος χειμῶνος οὐ γενέσθαι τὸν κάλαμον· φασὶ γὰρ καὶ δοκεῖ βαθυνομένης τῆς λίμνης αὐξάνεσθαι τὸν κάλαμον εἰς μῆκος, μείναντα δὲ τὸν ἐπιόντα ἐνιαυτὸν ἀδρύνεσθαι· καὶ γίνεσθαι τὸν μὲν ἀδρυθέντα ζευγίτην, φῶς δὲ ἀν μὴ συμπαραμείνη τὸ

¹ κώμυσι: lit 'bundles.'

² δύ' ἔτη conj. W.; διετῆ UΜV Ald.

³ B.C. 338.

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floating islands, the stout form in the 'reed-beds'¹; this name they give to the places where there is a thick mass of reed with its roots entangled together. This occurs in any part of the lake where there is rich soil. It is said that the 'stake-reed' is also sometimes found in the same places as the reed used for pipes, in which places it is longer than the 'stake-reed' found elsewhere, but gets worm-eaten. These then are the differences in reeds of which they tell.

As to the reed used for pipes, it is not true, as some say, that it only grows once in nine years and that this is its regular rule of growth; it grows in general whenever the lake is full: but, because in former days this was supposed to happen generally once in nine years, they made the growth of the reed to correspond, taking what was really an accident to be a regular principle. As a matter of fact it grows whenever after a rainy season the water remains in the lake for at least two years,² and it is finer if the water remains longer; this is specially remembered to have happened in recent times at the time of the battle of Chaeronea.³ For before that period they told me that the lake was for several years deep⁴; and, at a time later than that, when there was a severe visitation of the plague, it filled up; but, as the water did not remain but failed in winter, the reed did not grow; for they say, apparently with good reason, that, when the lake is deep, the reed increases in height, and, persisting for the next year, matures its growth; and that the reed which thus matures is suitable for making a reed mouthpiece,⁵ while that for which the water has not remained is

¹ ἔτη πλείω conj. Scal. from G; ἔτι πλείω UMV; ἔτι πλείουν Ald.

² See n. on *τὸ στόμα τῶν γλωττῶν*, § 4.

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ῦδωρ βομβυκίαν. τὴν μὲν οὖν γένεσιν εἶναι τοιαύτην.

4 Διαφέρειν δὲ τῶν ἄλλων καλάμων ὡς καθ' ὅλου λαβεῖν εὐτροφίᾳ τινὶ τῆς φύσεως· εὐπληθέστερον γὰρ εἶναι καὶ εὐσαρκότερον καὶ ὅλως δὲ θῆλυν τῇ προσόψει. καὶ γὰρ τὸ φύλλον πλατύτερον ἔχειν καὶ λευκότερον τὴν δὲ ἀνθήλην ἐλάττω τῶν ἄλλων, τινὰς δὲ ὅλως οὐκ ἔχειν, οὓς καὶ προσαγορεύουσιν εὔνουχίας· ἐξ ὧν ἄριστα μέν φασί τινες γίνεσθαι τὰ ζεύγη, κατορθοῦν δὲ ὀλίγα παρὰ τὴν ἐργασίαν.

Τὴν δὲ τομὴν ὡραίαν εἶναι πρὸ Ἀντιγενίδου μέν, ἡνίκ' ηὔλουν ἀπλάστως, ὑπ' Ἀρκτουρον Βοηδρομιῶνος μηνός· τὸν γὰρ οὕτω τμηθέντα συχνοῖς μὲν ἔτεσιν ὑστερον γίνεσθαι χρήσιμον καὶ προκαταυλήσεως δεῖσθαι πολλῆς, συμμύειν δὲ τὸ στόμα τῶν γλωττῶν, δι πρὸς τὴν διακτηρίαν εἶναι 5 χρήσιμον. ἐπεὶ δὲ εἰς τὴν πλάσιν μετέβησαν, καὶ ἡ τομὴ μετεκινήθη· τέμνουσι γὰρ δὴ νῦν τοῦ Σκιρροφοριῶνος καὶ Ἐκατομβαιῶνος ὡσπερ πρὸ τροπῶν μικρὸν ἡ ὑπὸ τροπάς. γίνεσθαι δέ φασι τρίενόν τε χρήσιμον καὶ καταυλήσεως βραχείας

¹ *Βομβυκίαν.* In one kind of pipe the performer blew, not directly on to the 'reed,' but into a cap in which it was enclosed; this cap, from the resemblance in shape to a cocoon, was called *βόμβυξ*.

² *εἶναι* add. W.

³ Plin. 16. 169-172. ⁴ September.

⁵ i.e. between the free end of the vibrating 'tongue' and

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suitable for making a 'cap.'¹ Such then, it is said, is² the reed's way of growth.

³ Also it is said to differ from other reeds, to speak generally, in a certain luxuriance of growth, being of a fuller and more fleshy character, and, one may say, 'female' in appearance. For it is said that even the leaf is broader and whiter, though the plume is smaller than that of other reeds, and some have no plume at all; these they call 'eunuch-reeds.' From these they say that the best mouthpieces are made, though many are spoiled in the making.

Till the time of Antigenidas, before which men played the pipe in the simple style, they say that the proper season for cutting the reeds was the month Boëdromion⁴ about the rising of Arcturus; for, although the reed so cut did not become fit for use for many years after and needed a great deal of preliminary playing upon, yet the opening⁵ of the reed-tongues is well closed, which is a good thing for the purpose of accompaniment.⁶ But when a change was made to the more elaborate style of playing, the time of cutting the reeds was also altered; for in our own time they cut them in the months Skirrophorion⁷ or Hekatombaion⁸ about the solstice or a little earlier.⁹ And they say that the reed becomes fit for use in three years and needs but little preliminary playing upon, and that the reed-tongues

the body or 'lay' of the reed mouthpiece: the instrument implied throughout is apparently one with a single vibrating 'tongue' (reed) like the modern clarinet.

⁶ διακτηρίαν UMV; διακτορίαν Ald. ? πρὸς τὸ ἀκροατήριον, 'for the concert-room'; *quod erat illis theatrorum moribus utilius* Plin. *l.c.*

⁷ June. ⁸ July.

⁹ ὥσπερ conj. W.; ὥσπερει UH.; ὡς περὶ MVAld.

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δεῖσθαι καὶ κατασπάσματα τὰς γλώττας ἵσχειν· τοῦτο δὲ ἀναγκαῖον τοῖς μετὰ πλάσματος αὐλοῦσι. τοῦ μὲν οὖν ζευγίτου ταύτας εἶναι τὰς ὥρας τῆς τομῆς.

6 Ἡ δὲ ἐργασία γίνεται τοῦτον τὸν τρόπον· ὅταν συλλέξωσι τιθέασιν ὑπαίθριον τοῦ χειμῶνος ἐν τῷ λέμματι· τοῦ δὲ ἥρος περικαθάραντες καὶ ἐκτρίψαντες εἰς τὸν ἥλιον ἔθεσαν. τοῦ θέρους δὲ μετὰ ταῦτα συντεμόντες εἰς τὰ μεσογονάτια πάλιν ὑπαίθριον τιθέασι χρόνον τινά. προσλείπουσι δὲ τῷ μεσογονατίῳ τὸ πρὸς τοὺς βλαστοὺς γόνυν· τὰ δὲ μήκη τὰ τούτων οὐ γίνεται διπαλαίστων ἐλάττω. βέλτιστα μὲν οὖν εἶναι τῶν μεσογονατίων πρὸς τὴν ζευγοποιίαν ὅλου τοῦ καλάμου τὰ μέσα· μαλακώτατα δὲ ἵσχειν ζεύγη τὰ πρὸς τοὺς βλαστούς, σκληρότατα δὲ τὰ πρὸς τὴν ῥίζην· συμφωνεῖν δὲ τὰς γλώττας τὰς ἐκ τοῦ αὐτοῦ μεσογονατίου, τὰς δὲ ἄλλας οὐ συμφωνεῖν· καὶ τὴν μὲν πρὸς τὴν ῥίζην ἀριστερὰν εἶναι, τὴν δὲ πρὸς τοὺς βλαστούς δεξιάν. τμηθέντος δὲ δίχα τοῦ μεσογονατίου τὸ στόμα τῆς γλώττης ἐκατέρας γίνεσθαι κατὰ τὴν τοῦ καλάμου τομήν· ἐὰν δὲ ἄλλουν τρόπον ἐργασθῶσιν αἱ γλώτται, ταύτας οὐ πάνυ συμφωνεῖν· ἡ μὲν οὖν ἐργασία τοιαύτη.

¹ κατασπάσματα: lit. ‘convulsions’; i.e. the strong vibrations of a ‘tongue,’ the free end of which is kept away from the body or ‘lay’ of the mouthpiece. Such a ‘reed’ would have the effect of giving to the pipes a fuller and louder tone.

² i.e. so as to make a closed end.

have ample vibration,¹ which is essential for those who play in the elaborate style. Such, they tell us, are the proper seasons for cutting the reed used for the reed mouthpiece.

The manufacture is carried out in the following manner. Having collected the reed-stems they lay them in the open air during the winter, leaving on the rind; in the spring they strip this off, and, having rubbed the reeds thoroughly, put them in the sun. Later on, in the summer, they cut the sections from knot to knot into lengths and again put them for some time in the open air. They leave the upper knot on this internodal section²; and the lengths thus obtained are not less than two palmsbreadths long. Now they say that for making mouthpieces the best lengths are those of the middle of the reed, whereas the lengths towards the upper growths make very soft mouthpieces and those next to the root very hard ones. They say too that the reed-tongues made out of the same length are of the same quality, while those made from different lengths are not; also that the one from the length next to the root forms a left-hand³ reed-tongue, and that from the length towards the upper growths a right-hand³ reed-tongue. Moreover, when the length is slit, the opening of the reed-tongues in either case is made towards the point at which the reed was cut⁴; and, if the reed-tongues are made in any other manner, they are not quite of the same quality. Such then is the method of manufacture.

¹ i.e. the vibrating 'tongues' (reeds) for the left-hand and the right-hand pipe of the Double Pipe respectively.

² i.e. not at the closed end, but at the end which was 'lower' when the cane was growing: cf. § 6, *προσλείπονται δέ κ.τ.λ.*

8 Φύεται δὲ πλεῖστος μὲν μεταξὺ τοῦ Κηφισοῦ καὶ τοῦ Μέλανος· οὗτος δὲ ὁ τόπος προσαγορεύεται μὲν Πελεκανία· τούτου δ' ἔστιν ἄπτα Χύτροι καλούμενοι βαθύσματα τῆς λίμνης, ἐν οἷς κάλλιστόν φασι γίνεσθαι· <γίνεσθαι> δὲ καὶ καθ' ὃ ἡ Προβατία καλουμένη καταφέρεται· τοῦτο δ' ἔστι ποταμὸς ρέων ἐκ Αεβαδείας. κάλλιστος δὲ δοκεῖ πάντων γίνεσθαι περὶ τὴν Ὀξεῖαν καλουμένην Καμπήν· ὁ δὲ τόπος οὗτος ἔστιν ἐμβολὴ τοῦ Κηφισοῦ. γειτνιά δ' αὐτῷ πεδίον εὔγειον, δ

9 προσαγορεύουσι Ίππιαν. προσβορρος δὲ τόπος ἄλλος τῆς Ὀξείας Καμπῆς ἔστιν, ὃν καλοῦσι Βοηδρίαν· φύεσθαι δέ φασι καὶ κατὰ ταύτην εὐγενῆ τὸν κάλαμον. τὸ δὲ ὅλον, οὐ δὲ ἡ βαθύγειον καὶ εὔγειον χωρίον καὶ ἰλυώδες καὶ ὁ Κηφισὸς ἀναμίσγεται καὶ πρὸς τούτοις βάθυσμα τῆς λίμνης, κάλλιστον γίνεσθαι κάλαμον. περὶ γὰρ τὴν Ὀξεῖαν Καμπήν καὶ τὴν Βοηδρίαν πάντα ταῦτα ὑπάρχειν. ὅτι δὲ ὁ Κηφισὸς μεγάλην ἔχει ροπὴν εἰς τὸ ποιεῖν καλὸν τὸν κάλαμον σημεῖον ἔχουσι· καθ' ὃν γὰρ τόπον ὁ Μέλας καλούμενος ἐμβάλλει βαθείας οὕσης τῆς λίμνης καὶ τοῦ ἐδάφους εὔγείου καὶ ἰλυώδους, ἡ ὅλως μὴ γίνεσθαι ἡ φαῦλον. ἡ μὲν οὖν γένεσις καὶ φύσις τοῦ αὐλητικοῦ καὶ ἡ κατεργασία καὶ τίνας ἔχει διαφορὰς πρὸς τοὺς ἄλλους ἴκανως εἰρήσθω.

10 Γένη δὲ οὐ ταῦτα μόνον ἀλλὰ πλείω τοῦ καλάμου τυγχάνει φανερὰς ἔχοντα τῇ αἰσθήσει διαφοράς· ὁ μὲν γὰρ πυκνὸς καὶ τῇ σαρκὶ καὶ τοῖς

¹ cf. Plut. *Sulla*, 20.

² i.e. the so-called 'Lake' Copais.

³ καὶ add. W.

This reed grows in greatest abundance between the Kephisos and the Black River¹; this district is called Pelekania, and in it are certain 'pots,' as they are called, which are deep holes in the marsh,² and in these holes they say that it grows fairest; it is also³ said to be found⁴ where the river called the 'Sheep River' comes down, which is a stream that flows from Lebadeia. But it appears to grow fairest of all near 'the Sharp Bend'; this place is the mouth of the Kephisos; near it is a rich plain called Hippias. There is another region north of the Sharp Bend called Boedrias; and here too they say that the reed grows fine, and in general that it is fairest wherever there is a piece of land with deep rich alluvial soil, where also Kephisos mingle⁵ his waters with the soil, and where there is further a deep hole in the marsh; for that about the Sharp Bend and Boedrias all these conditions are found. As proof that the Kephisos has a great effect in producing the reed of good quality they have the fact that, where the river called the 'Black River' flows into the marsh, though the marsh is there deep and the bottom of good alluvial soil, it either does not grow at all or at best but of poor quality. Let this suffice for an account of the growth and character of the reed used for pipes, of the manufacture, and of its distinctive features as compared with other reeds.

But these are not the only kinds of reed; there are several others⁶ with distinctive characters which are easily recognised; there is one that is of compact growth in flesh and has its joints close together;

¹ γίνεσθαι add. Sch.; φασι· γίνεσθαι δὲ καθ' Ἀ UMVP; so Ald., but καθ' ὅν.

² ἀναμίσγεται : ? ἀναμίσγηται; cf. Plut. *Sull. l.c.*

³ Plin. 16. 164-167; Diosc. 1. 85.

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γόνασιν, ὁ δὲ μανὸς καὶ ὀλιγογόνατος· καὶ ὁ μὲν κοῦλος, ὃν καλοῦσί τινες συριγγίαν, οὐδὲν γὰρ ὡς εἰπεῖν ἔχει ξύλου καὶ σαρκός· ὁ δὲ στερεὸς καὶ συμπλήρης μικροῦ. καὶ ὁ μὲν βραχύς, ὁ δὲ εὐανυξῆς καὶ ὑψηλὸς καὶ παχύς. ὁ δὲ ὀλιγόφυυλλος καὶ μονόφυυλλος. ὅλως δὲ πολλαὶ τινές εἰσι διαφοραὶ κατὰ τὰς χρείας· ἔκαστος γὰρ πρὸς ἔκαστα χρήσιμος.

11 Ὁνόμασι δὲ ἄλλοι ἄλλοις προσαγορεύουσι· κοινότατον δέ πως ὁ δόναξ, ὃν καὶ λοχμωδέστατόν γέ φασιν εἶναι καὶ μάλιστα φύεσθαι παρὰ τοὺς ποταμοὺς καὶ τὰς λίμνας. διαφέρειν δ' ὅμως παντὸς καλάμου πολὺ τόν τε ἐν τῷ ξηρῷ καὶ τὸν ἐν τοῖς ὕδαισι φυόμενον. Ἰδιος δὲ καὶ ὁ τοξικός, ὃν δὴ Κρητικόν τινες καλοῦσιν· ὀλιγογόνατος μὲν σαρκωδέστερος δὲ πάντων καὶ μάλιστα κάμψιν δεχόμενος, καὶ ὅλως ἄγεσθαι δυνάμενος ὡς ἀν θέλῃ τις θερμαινόμενος.

12 Ἐχουσι δέ, ὥσπερ ἐλέχθη, καὶ κατὰ τὰ φύλλα μεγάλας διαφορὰς οὐ πλήθει καὶ μεγέθει μόνον ἀλλὰ καὶ χροιᾶ. ποικίλος γὰρ ὁ Αακωνικὸς καλούμενος. ἔτι δὲ τῇ θέσει καὶ προσφύσει· κάτωθεν γὰρ ἔνιοι πλεῖστα φέρουσι τῶν φύλλων, αὐτὸς δὲ ὥσπερ ἐκ θάμνου πέφυκε. σχεδὸν δέ τινές φασι καὶ τῶν λιμναίων ταύτην εἶναι τὴν διαφοράν, τὸ πολύφυυλλον καὶ παρόμοιον ἔχειν τρόπον τινὰ τὸ φύλλον τῷ τοῦ κυπείρου καὶ

another that is of open growth, with few joints; there is the hollow reed called by some the 'tube-reed,'¹ inasmuch as it has hardly any wood or flesh; there is another which is solid and almost entirely filled with substance; there is another which is short, and another which is of strong growth tall and stout; there is one which is slender and has many leaves, another which has few leaves or only one. And in general there are many differences in natural character and in usefulness, each kind being useful for some particular purpose.

Some distinguish the various kinds by different names; commonest perhaps is the pole-reed, which is said to be of very bushy habit, and to grow chiefly by rivers and lakes. And it is said that there is a wide difference in reeds in general between those that grow on dry land and those that grow in the water. Quite distinct again is the 'archer's' reed, which some call the 'Cretan': this has few joints and is fleshier than any of the others; it can also be most freely bent, and in general, when warmed, may be turned about as one pleases.

The various kinds have also, as was said, great differences in the leaves, not only in number and size, but also in colour. That called the 'Laconian' reed is parti-coloured. They also differ in the position and attachment of the leaves; some have most of their leaves low down, and the reed itself grows out of a sort of a bush. Indeed some say that this may be taken as the distinctive character of those which grow in lakes, namely, that these have many leaves, and that their foliage in a manner

συρίγγιαν conj. Sch. from Plin. *l.c.*, *syringiam*; cf. Diosc. *l.c.*, *Geop.* 2. 6. 23. *συριγλ* U; *σύριγγι* MV; *σύριγγα* Ald. H.

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φλεὼ καὶ θρύου καὶ βουτόμου· σκέψασθαι δὲ δεῖ τοῦτο.

13 Γένος δέ τι καλάμου φύεται καὶ ἐπίγειον, ὃ οὐκ εἰς ὄρθὸν ἀλλ' ἐπὶ γῆς ἀφίησι τὸν καυλόν, ὥσπερ ἡ ἄγρωστις, καὶ οὕτως ποιεῖται τὴν αὔξησιν. ἔστι δὲ ὁ μὲν ἄρρην στερεός, καλεῖται δὲ ὑπό τινων εἰλετίας. . . .

‘Ο δὲ Ἰνδικὸς ἐν μεγίστῃ διαφορᾷ καὶ ὥσπερ ἔτερον ὅλως τὸ γένος¹ ἔστι δὲ ὁ μὲν ἄρρην στερεός, ὁ δὲ θῆλυς κοῦλος· διαιροῦσι γὰρ καὶ τοῦτον τῷ ἄρρενι καὶ θήλει. φύονται δ' ἐξ ἑνὸς πυθμένος πολλοὶ καὶ οὐ λοχμώδεις· τὸ δὲ φύλλον οὐ μακρὸν ἀλλ' ὅμοιον τῇ ἴτεᾳ· τῷ δὲ μεγέθει μεγάλοι καὶ εὐπαγεῖς, ὥστε ἀκοντίοις χρῆσθαι. φύονται δὲ οὗτοι περὶ τὸν Ἀκεσίνην ποταμόν. ἄπας δὲ κάλαμος εὔζως καὶ τεμνόμενος καὶ ἐπικαιόμενος καλλίων βλαστάνει· ἔτι δὲ παχύρριζος καὶ πολύρριζος, δι' ὃ καὶ δυσώλεθρος. ἡ δὲ ρίζα γονατώδης, ὥσπερ ἡ τῆς ἄγρωστίδος, πλὴν οὐ παντὸς ὁμοίως. ἀλλὰ περὶ μὲν καλάμων ἴκανῶς εἰρήσθω.

XII. Κατάλοιπον δὲ εἰπεῖν ὡσὰν ἐκ τοῦ γένους τούτου περὶ σχοίνου· καὶ γὰρ καὶ τοῦτο τῶν ἐνύδρων θετέον. ἔστι δὲ αὐτοῦ τρία εἰδη, καθάπερ τινὲς διαιροῦσιν, ὃ τε ὁξὺς καὶ ἄκαρπος, δν δὴ καλοῦσιν ἄρρενα, καὶ ὁ κάρπιμος, δν μελαγκρανὸν

¹ θρύον, a kind of grass (see Index ; cf. Hom. Il. 21. 351), conj. Sch.; θρύον MSS.; however Plut. Nat. Quaest. 2 gives θρύον along with τύφη and φλεὼς in a list of marsh plants.

² δὲ δεῖ τοῦτο conj. W.; δὲ τοῦτο UΜV Ald.

resembles that of galingale *phleos thryon*¹ and sedge ; but this needs² further enquiry.

There is also a kind of reed (bush-grass) which grows on land, and which is not erect, but sends out its stem over the ground, like the dog's-tooth grass, and so makes its growth. The 'male' reed is solid : some call it *eiletias*. . . .³

The Indian reed (bamboo) is very distinct, and as it were a totally different kind ; the 'male' is solid and the 'female' hollow (for in this kind too they distinguish a 'male' and a 'female' form) ; a number of reeds of this kind grow from one base and they do not form a bush ; the leaf is not long, but resembles the willow leaf ; these reeds are of great size and of good substance, so that they are used for javelins. They grow by the river Akesines.⁴ All reeds are tenacious of life, and, if cut or burnt down, grow up again more vigorously ; also their roots are stout and numerous, so that the plant is hard to destroy. The root is jointed, like that of the dog's-tooth grass, but this is not equally so in all kinds. However let this suffice for an account of reeds.

Of rushes.

XII. It remains to speak of the rush,⁵ as though it belonged to this class of plants, inasmuch as we must reckon this also among water plants. Of this there are three kinds⁶ as some distinguish, the 'sharp' rush, which is barren and is called the 'male' ; the 'fruiting' kind which we call the 'black-

³ Sch. marks a lacuna ; there is nothing to correspond to δ μέν ορρών. ⁴ Chenab.

⁵ cf. 1. 5. 3 ; 1. 8. 1 ; Plin. 21. 112-115 ; Diosc. 4. 52.

⁶ See Index.

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καλούμεν διὰ τὸ μέλανα τὸν καρπὸν ἔχειν, παχύτερος δὲ οὗτος καὶ σαρκωδέστερος· καὶ τρίτος τῷ μεγέθει καὶ τῇ παχύτητι καὶ εὐσαρκίᾳ διαφέρων ὁ καλούμενος ὀλόσχοινος.

2 Ἡ μὲν οὖν μελαγκρανὶς αὐτός τις καθ' αὐτόν· ὁ δ' ὁξὺς καὶ ὀλόσχοινος ἐκ τοῦ αὐτοῦ φύονται· δὲ καὶ ἄτοπον φαίνεται, καὶ θαυμαστόν γ' ἦν ἵδεν ὅλης κομισθείσης τῆς σχοινιᾶς· οἱ πολλοὶ γὰρ ἥσαν ἄκαρποι πεφυκότες ἐκ τοῦ αὐτοῦ, κάρπιμοι δὲ ὀλίγοι. τοῦτο μὲν οὖν ἐπίσκεπτέον. ἐλάττους δὲ ὅλως οἱ κάρπιμοι· πρὸς γὰρ τὰ πλέγματα χρησιμώτερος ὁ ὀλόσχοινος διὰ τὸ σαρκώδες καὶ μαλακόν. κορυνὴ δὲ ὅλως ὁ κάρπιμος ἐξ αὐτοῦ τοῦ γραμμώδους ἔξοιδήσας, κάπειτα ἐκτίκτει καθάπερ ὡά. πρὸς μιὰν γὰρ ἀρχῆ γραμμώδει ἔχει τοὺς περισταχυώδεις μίσχους, ἐφ' ὧν ἄκρων παραπλαγίους τὰς τῶν ἄγγείων ἔχει στρογγυλότητας ὑποχασκούσας· ἐν τούτοις δὲ τὸ σπερμάτιον ἀκιδώδες ἔστι μέλαν ἐκάστῳ προσεμφερὲς τῷ τοῦ ἀστερίσκου πλήν ἀμενηνότερον. ῥίζαν δὲ ἔχει μακρὰν καὶ παχυτέραν πολὺ τοῦ σχοίνου· αὗτη δὲ αὐάίνεται καθ' ἔκαστον ἐνιαυτόν, εἰθ' ἐτέρα πάλιν ἀπὸ τῆς κεφαλῆς τοῦ σχοίνου καθίεται· τοῦτο δὲ καὶ ἐν τῇ ὅψει φανερὸν ἴδεν τὰς μὲν αὔας τὰς δὲ χλωρὰς καθιεμένας· ἡ δὲ κεφαλὴ ὄμοιά τῇ τῶν κρομίων καὶ τῇ τῶν γητείων, συμ-

¹ θ. γ' ἦν ἵδεν conj. W. from G; θ. ἐν γ' εἰδεῖν U; θ. ἐν γε ἵδεῖν MVP; θ. ἐνιδεῖν Ald.

² οἱ κάρπιμοι conj. R. Const.; οἱ καρποί Ald. H.

³ γὰρ seems meaningless; G has αὐτὲν.

⁴ κορυνὴ; cf. 3. 5. 1.

⁵ γραμμώδει conj. R. Const.; γραμμώδεις Ald. H.

head' because it has black fruit; this is stouter and fleshier: and third the 'entire rush,' as it is called, which is distinguished by its size stoutness and fleshiness.

Now the 'black-head' grows by itself, but the 'sharp' rush and the 'entire' rush grow from the same stock, which seems extraordinary, and indeed it was strange to see it¹ when the whole clump of rushes was brought before me; for from the same stock there were growing 'barren' rushes, which were the most numerous, and also a few 'fruiting' ones. This then is a matter for further enquiry. The 'fruiting'² ones are in general scarcer, for³ the 'entire rush' is more useful for wicker-work because of its fleshiness and pliancy. The 'fruiting' rush in general produces a club-like⁴ head which swells straight from the wiry stem, and then bears egg-like bodies; for attached to a single wiry⁵ base it has its very spike-like⁶ branches all round it, and on the ends of these it has its round vessels borne laterally and gaping⁷; in each of these is the small seed, which is pointed and black, and like that of the Michaelmas daisy, except that it is less solid. It has a long root, which is stouter than that of the ordinary rush; this withers every year, and then another strikes down again from the 'head'⁸ of the plant. And it is easy to observe that some of the roots as they are let down are withered, some green. The 'head' is like that of an onion or long onion,

⁶ περισταχνώδεις seems an impossible word; ? περὶ αὐτὸν τὸν σταχνώδεις.

⁷ ὄποχασκούσας conj. Sch.; ἐπισχαζόντας Ald. H.

⁸ i.e. the part above ground; cf. Plin. l.c. Sch. has disposed of the idea that κεφαλὴ is here a 'bulbous' root.

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πεφυκυνία πως ἐκ πλειόνων εἰς ταῦτὸ καὶ πλατεῖα κάτωθεν ἔχουσα κελύφη ὑπέρυθρα. συμβαίνει δὲ οὐν ἵδιον ἐπὶ τῶν ρίζῶν εἰ αὐάινονται κατ' ἐνιαυτὸν καὶ ἐκ τοῦ ἄνωθεν πάλιν ἡ γένεσις. τῶν μὲν οὖν σχοίνων τοιαύτη τις φύσις.

4 Εἰ δὲ καὶ ὁ βάτος καὶ ὁ παλίουρος ἐνυδρά πώς ἐστιν ἡ πάρυδρα, καθάπερ ἐνιαχοῦ, φανεραὶ σχεδὸν καὶ αἱ τούτων διαφοραί· περὶ ἀμφοῖν γὰρ εἴρηται πρότερον.

[Τῶν δὲ νήσων τῶν πλοιάδων τῶν ἐν Ὀρχομενῷ τὰ μὲν μεγέθη παντοδαπὰ τυγχάνει, τὰ δὲ μέγιστα αὐτῶν ἐστιν ὅσον τριῶν σταδίων τὴν περιμετρον. ἐν Αἰγύπτῳ δὲ μάλιστα μεγάλα σφόδρα συνίσταται, ὥστε καὶ ὃς ἐν αὐταῖς ἐγγίνεσθαι πολλούς, οὓς καὶ κυνηγετοῦσι διαβαίνοντες.] καὶ περὶ μὲν ἐνύδρων ταῦτ' εἰρήσθω.

XIII. Περὶ δὲ βραχυβιότητος φυτῶν καὶ δένδρων τῶν ἐνύδρων ἐπὶ τοσοῦτον ἔχομεν ὡς ἀν καθ' ὅλου λέγοντες, δτι βραχυβιώτερα τῶν χερσαίων ἐστί, καθάπερ καὶ τὰ ζῶα. τοὺς δὲ καθ' ἔκαστον βίους ἴστορῆσαι δεῖ τῶν χερσαίων. τὰ μὲν οὖν ἄγριά φασιν οὐδεμίαν ἔχειν ὡς εἰπεῖν οἱ ὄρεοτύποι διαφοράν, ἀλλὰ πάντα εἶναι μακρόβια καὶ οὐθὲν βραχύβιον αὐτὸ μὲν τοῦτο ἵσως ἀληθὲς λέγοντες· ἀπαντα γὰρ ὑπερτείνει πολὺ τὴν τῶν ἄλλων ζωήν. οὐ μὴν ἀλλ' ὅμως ἐστὶ τὰ μὲν μᾶλλον τὰ δ' ἡττον μακρόβια, καθάπερ ἐν τοῖς ἡμέροις· ποῖα

¹ 3. 18. 3 and 4; 4. 8. 1.

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being, as it were, made up of several united together ; it is broad, and underneath it has reddish scales. Now it is a peculiar fact about the roots of this plant that they wither every year and that the fresh growth of roots comes from the part of the plant which is above ground. Such is the character of rushes.

Bramble and Christ's thorn may be considered to some extent plants of the water or the waterside, as they are in some districts ; but the distinctive characters of these plants are fairly clear, for we have spoken of both already.¹

The floating islands of Orchomenos² are of various sizes, the largest being about three furlongs in circumference. But in Egypt very large ones form, so that even a number of boars are found in them, and men go across to the islands to hunt them. Let this account of water-plants suffice.

Of the length or shortness of the life of plants, and the causes.

XIII. As to the comparative shortness of life of plants and trees of the water we may say thus much as a general account, that, like the water-animals, they are shorter-lived than those of the dry land. But we must enquire into the lives of those of the dry land severally. Now the woodmen say that the wild kinds are almost³ without exception long-lived, and none of them is short-lived : so far they may be speaking the truth ; all such plants do live far longer than others. However, just as in the case of cultivated plants, some are longer-lived than others,

² cf. 4. 10. 2, to which § this note perhaps belongs.

³ ὡς εἰνεῖν conj. Sch.; ὡς εἰπεῖν U.; ὡς εἰποι MV; ὡς δὲ εἰποῦν Ald. H.

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δὲ ταῦτα σκεπτέον. τὰ δὲ ἥμερα φανερῶς διαφέρει τῷ τὰ μὲν εἶναι μακρόβια τὰ δὲ βραχύβια· ὡς δ' ἀπλῶς εἰπεῖν τὰ ἄγρια τῶν ἥμέρων μακροβιώτερα καὶ ὅλως τῷ γένει καὶ τὰ ἀντιδιηρημένα καθ' ἔκαστον, οἷον κότινος ἐλάας καὶ ἀχρὰς ἀπίον ἐρινεὸς συκῆς· ἵσχυρότερα γὰρ καὶ πυκνότερα καὶ ἀγονώτερα τοῖς περικαρπίοις.

2 Τὴν δὲ μακροβιότητα μαρτυροῦσιν ἐπί γέ τινων καὶ ἥμέρων καὶ ἄγριων καὶ αἱ παραδεδομέναι φῆμαι παρὰ τῶν μυθολόγων· ἐλάαν μὲν γὰρ λέγουσι τὴν Ἀθήνησι, φοίνικα δὲ τὸν ἐν Δῆλῳ, κότινον δὲ τὸν ἐν Ὁλυμπίᾳ, ἀφ' οὗ ὁ στέφανος· φηγοὺς δὲ τὰς ἐν Ἰλίῳ τὰς ἐπὶ τοῦ Ἰλου μυήματος· τινὲς δέ φασι καὶ τὴν ἐν Δελφοῖς πλάτανον Ἀγαμέμνονα φυτεῦσαι καὶ τὴν ἐν Καφύαις τῆς Ἀρκαδίας. ταῦτα μὲν οὖν ὅπως ἔχει τάχ' ἀν ἔτερος εἴη λόγος· ὅτι δέ ἐστι μεγάλη διαφορὰ τῶν δένδρων φανερόν· μακρόβια μὲν γὰρ τά τε προειρημένα καὶ ἔτερα πλείω· βραχύβια δὲ καὶ τὰ τοιαῦτα ὁμολογουμένως, οἷον ῥοιὰ συκῆ μηλέα, καὶ τούτων ἡ ἡρινὴ μᾶλλον καὶ ἡ γλυκεῖα τῆς ὁξείας, ὥσπερ τῶν ῥοῶν ἡ ἀπύρηνος. βραχύβια δὲ καὶ ἀμπέλων ἔνια γένη καὶ μάλιστα τὰ πολύκαρπα· δοκεῖ δὲ καὶ τὰ πάρυδρα βραχυβιώτερα

¹ καὶ τὰ ἀντ. conj. W.; κατὰ ἀντ. UMV; τὰ ἀντ. Ald.H.

² περικαρπίοις : cf. C.P. 1. 17. 5.

³ On the Acropolis : cf. Hdt. 8. 55 ; Soph. O.C. 694 foll.

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and we must consider which these are. Cultivated plants plainly differ as to the length of their lives, but, to speak generally, wild plants are longer-lived than cultivated ones, both taken as classes, and also when one compares¹ the wild and cultivated forms of particular plants: thus the wild olive pear and fig are longer-lived than the corresponding cultivated trees; for the wild forms of these are stronger and of closer growth, and they do not produce such well-developed fruit-pulp.²

To the long-lived character of some plants, both cultivated and wild, witness is borne also by the tales handed down in mythology, as of the olive at Athens,³ the palm in Delos,⁴ and the wild olive at Olympia, from which the wreaths for the games are made; or again of the Valonia oaks at Ilium, planted on the tomb of Illos. Again some say that Agamemnon planted the plane at Delphi, and the one at Kaphyai⁵ in Arcadia. Now how this is may perhaps be another story, but anyhow it is plain that there is a great difference between trees in this respect; the kinds that have been mentioned, and many others besides, are long-lived, while the following are admittedly short-lived—pomegranate fig apple: and among apples the ‘spring’ sort and the ‘sweet’ apple are shorter-lived than the ‘sour’ apple, even as the ‘stoneless’ pomegranate is shorter-lived than the other kinds. Also some kinds of vine are short-lived, especially those which bear much fruit; and it appears that trees which grow by water are shorter-

⁴ Under which Leto gave birth to Artemis and Apollo: cf. Paus. 8. 48. 3; Cic. *de Leg.* 1. 1.; Plin. 16. 238.

⁵ Its planting is ascribed to Menelaus by Paus. 8. 23. 3.

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τῶν ἐν τοῖς ξηροῖς εἶναι, οἷον ἵτεα λεύκη ἀκτὴ
αἴγειρος.

3 Ἐνια δὲ γηράσκει μὲν καὶ σήπεται ταχέως,
παραβλαστάνει δὲ πάλιν ἐκ τῶν αὐτῶν, ὥσπερ αἱ
δάφναι καὶ αἱ μηλέαι τε καὶ αἱ ρόαι καὶ τῶν
φιλύδρων τὰ πολλά· περὶ ὧν καὶ σκέψαιτ¹ ἀν
τις πότερα ταύτα δεῖ λέγειν ἢ ἔτερα· καθάπερ εἴ
τις τὸ στέλεχος ἀποκόψας, ὥσπερ ποιοῦσιν οἱ
γεωργοί, πάλιν ἀναθεραπεύοι τοὺς βλαστούς, ἢ εἰ
καὶ ὅλως ἐκκόψειν ἄχρι τῶν ριζῶν καὶ ἐπικαύ-
σειεν· καὶ γὰρ ταῦτα ποιοῦσιν, ὅτε δὲ καὶ ἀπὸ
τοῦ αὐτομάτου συμβαίνει πότερα δὴ τοῦτο ταύτο
δεῖ λέγειν ἢ ἔτερον; ἢ μὲν γὰρ ἀεὶ τὰ μέρη τὰς
αὐξήσεις καὶ φθίσεις φαίνεται παραλλάττοντα
καὶ ἔτι τὰς διακαθάρσεις τὰς ὑπ' αὐτῶν, ταύτη
μὲν ἀν δόξει ταύτον εἶναι· τί γὰρ ἀν ἐπὶ τούτων
4 ἢ ἐκείνων διαφέροι; ἢ δ' ὥσπερ οὐσία καὶ φύσις
τοῦ δένδρου μάλιστ² ἀν φαίνοιτο τὸ στέλεχος, ὅταν
μεταλλάττῃ τοῦτο, καν τὸ ὅλον ἔτερον ὑπολάβοι
τις, εἰ μὴ ἄρα διὰ τὸ ἀπὸ τῶν αὐτῶν ἀρχῶν εἶναι
ταύτῳ θείη· καίτοι πολλάκις συμβαίνει καὶ τὰς
ρίζας ἔτέρας εἶναι καὶ μεταβάλλειν τῶν μὲν σηπο-
μένων τῶν δ' ἐξ ἀρχῆς βλαστανουσῶν. ἐπεί, ἐὰν
ἀληθὲς ἡ, ὡς γέ τινές φασι, τὰς ἀμπέλους μακρο-

¹ cf. C.P. 2. 11. 5.

² ἀναθεραπεύοι conj. W.; ἀναθεραπεύει Ald.

³ ἢ εἰ καὶ ὅλως conj. W.; ἢ εἰ καὶ καλῶς U; ἀεὶ καὶ καλῶς
MV; καὶ εἰ καλῶς Ald. H.

⁴ Sc. and then encourage new growth.

lived than those which live in dry places : this is true of willow abele elder and black poplar.

Some trees, though they grow old and decay quickly, shoot up again from the same stock,¹ as bay apple pomegranate and most of the water-loving trees. About these one might enquire whether one should call the new growth the same tree or a new one ; to take a similar case, if, after cutting down the trunk, one should, as the husbandmen do, encourage² the new shoots to grow again, or if³ one should cut the tree right down to the roots and burn the stump,⁴ (for these things are commonly done, and they also sometimes occur naturally); are we then here too, to call the new growth the same tree, or another one ? In so far as it is always the parts of the tree which appear to alternate their periods of growth and decay and also the prunings which they themselves thus make, so far the new and the old growth might seem to be the same tree ; for what difference can there be in the one as compared with the other ?⁵ On the other hand, in so far as the trunk would seem to be above all the essential part of the tree, which gives it its special character, when this changes, one might suppose that the whole tree becomes something different—unless indeed one should lay down that to have the same starting-point constitutes identity ; whereas it often⁶ happens that the roots too are different and undergo a change, since some decay and others grow afresh.⁷ For if it be true, as some assert, that the reason why the vine is the longest

¹ i.e. how can the substitution of one set of 'parts' for another destroy the identity of the tree as a whole ?

⁶ πολλάκις conj. Sch. from G ; πολλὰ καὶ Ald. H.

⁷ And so the 'starting-point' too is not constant.

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βιωτάτας είναι τῷ μὴ φύειν ἐτέρας ἀλλ' ἐξ αὐτῶν
ἀεὶ συναναπληροῦσθαι, γελοῖον ἀνίσως δοκοίη τοι-
αύτη σύγκρισις ἐὰν <μὴ> μένη τὸ στέλεχος· αὗτη
γὰρ οίον ὑπόθεσις καὶ φύσις δένδρων. τοῦτο μὲν
οὖν ὄποτέρως ποτὲ λεκτέον οὐθὲν ἀν διενέγκαι
πρὸς τὰ νῦν. τάχα δ' ἀν εἴη μακροβιώτατον τὸ
πάντως δυνάμενον ἀνταρκεῖν, ὥσπερ ἡ ἐλάα καὶ
τῷ στελέχει καὶ τῇ παραβλαστήσει καὶ τῷ
δυσωλέθρους ἔχειν τὰς ρίζας. δοκεῖ δὲ ὁ βίος
τῆς γε μιᾶς είναι, καθ' ὃν τὸ στέλεχος δεῖ τὴν
ἀρχὴν τιθέντα μέτρον ἀναμετρεῖν τὸν χρόνον,
μάλιστα περὶ ἔτη διακόσια. εἰ δ' ὅπερ ἐπὶ τῶν
ἀμπέλων λέγουσί τινες, ὡς παραιρουμένων τῶν
ρίζῶν κατὰ μέρος δύναται διαμένειν τὸ στέλεχος,
καὶ ἡ ὅλη φύσις ὁμοία καὶ ὁμοιοφόρος ὄποσονοῦν
χρόνον, μακροβιώτατον ἀν εἴη πάντων. φασὶ δὲ
δεῖν οὕτω ποιεῖν ὅταν ἡδη δοκῆ καταφέρεσθαι
κλήματά τε ἐπιβάλλειν καὶ καρποῦσθαι τὸν
ἐνιαυτόν· μετὰ δὲ ταῦτα κατασκάψαντα ἐπὶ¹
θάτερα τῆς ἀμπέλου περικαθάραι πάσας τὰς
ρίζας, εἰτ' ἐμπλῆσαι φρυγάνων καὶ ἐπαμήσασθαι
τὴν γῆν· τούτῳ μὲν οὖν τῷ ἔτει κακῶς φέρειν
σφόδρα, τῷ δ' ὑστέρῳ βέλτιον, τῷ δὲ τρίτῳ καὶ

¹ ἐξ αὐτῶν Ald., sc. τῶν ρίζῶν; ἐκ τῶν αὐτῶν conj. W.

² i.e. such an argument practically assumes the permanence of the trunk, which in the case of the vine can hardly be considered apart from the root. δοκοίη τοιαύτη σύγκρισις I conj. from G; δικαιοτάτη σύγκρισις MVAld.; δικαιοτάτη συγκρίσεις U; δοκοίη είναι ἡ σύγκρισις conj. Sch.; so W. in his earlier edition: in his later editions he emends wildly.

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lived of trees, is that, instead of producing new roots, it always renews itself from the existing ones,¹ such an illustration must surely lead to an absurd conclusion,² unless³ we assume that the stock persists, as it must do, since it is, as it were, the fundamental and essential part of a tree. However it cannot matter much for our present purpose which account is the right one. Perhaps we may say that the longest-lived tree is that which in all ways is able to persist,⁴ as does the olive by its trunk, by its power of developing sidegrowth, and by the fact that its roots are so hard to destroy. It appears that the life of the individual olive (in regard to which one should make the trunk the essential part and standard⁵ in estimating the time), lasts for about two hundred years.⁶ But if it is true of the vine, as some say, that, if the roots are partly removed, the trunk is able to survive, and the whole character of the tree remains the same and produces like fruits for any period, however long, then the vine will be the longest-lived of all trees. They say that, when the vine seems to be deteriorating, this is what one should do:—one should encourage the growth of branches and gather the fruit that year; and after that one should dig on one side of the vine and prune away all the roots on that side, and then fill the hole with brushwood and heap up the soil. In that year, they say, the vine bears very badly, but better in the next, while in the

¹ I have inserted *μή*, which G seems to have read.

² ἀνταρκεῖν U, cf. Ar. *Eq.* 540; αὐταρκεῖν Ald.

³ καθ' ὃν τὸ στέλεχος δεῖ τὴν ἀρχὴν τιθέντα I conj. ; so G ; καθ' ὃν στέλεχος ἤδη τὴν ἀρχὴν τιθέντα μέτρον Ald. H. ; εἰ δεῖ for ἤδη U ; καθ' ὃ τοῦ στελέχους δεῖ τὸν ὄγκον τιθέντα μέτρον conj. W. ; καθ' ὃν τὸ στ. ἤδη ἀρχὴν καὶ μέτρον χρὴ conj. Sch. cf. end of § 4. ⁶ Plin. 16. 241.

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τετάρτῳ καθίστασθαι καὶ φέρειν πολλοὺς καὶ καλούς, ὥστε μηδὲν διαφέρειν ἡ ὅτε ἡκμαζεν· ἐπειδὰν δὲ πάλιν ἀποπληγῆ, θάτερον μέρος παρασκάπτειν καὶ θεραπεύειν ὁμοίως, καὶ οὕτως αἱεὶ διαμένειν· ποιεῖν δὲ τοῦτο μάλιστα δὶ’ ἐτῶν δέκα· δὶ’ ὁ καὶ κόπτειν οὐδέποτε τοὺς τοῦτο ποιοῦντας, ἀλλ’ ἐπὶ γενεὰς πολλὰς ταῦτα τὰ στελέχη διαμένειν, ὥστε μηδὲ μεμνῆσθαι τοὺς φυτεύσαντας· τοῦτο μὲν οὖν ἵσως τῶν πεπειραμένων ἀκούοντα δεῖ πιστεύειν. τὰ δὲ μακρόβια καὶ βραχύβια διὰ τῶν εἰρημένων θεωρητέον.

XIV. Νοσήματα δὲ τοῖς μὲν ἀγρίοις οὕ φασι ξυμβαίνειν ὑφ' ὧν ἀναιροῦνται, φαύλως δὲ διατίθεσθαι καὶ μάλιστα ἐπιδήλως ὅταν χαλαζοκοπηθῇ ἡ βλαστάνειν μέλλοντα ἡ ἀρχόμενα ἡ ἀνθοῦντα, καὶ ὅταν ἡ πνεῦμα ψυχρὸν ἡ θερμὸν ἐπιγένηται κατὰ τούτους τοὺς καιρούς. ὑπὸ δὲ τῶν ὡραίων χειμώνων οὐδὲ ἀν ὑπερβάλλοντες ὡσιν οὐδὲν πάσχειν, ἀλλὰ καὶ ξυμφέρειν πᾶσι χειμασθῆναι μὴ χειμασθέντα γὰρ κακοβλαστό² τερα γίνεσθαι. τοῖς δὲ ἡμέροις ἐστὶν πλείω νοσήματα, καὶ τὰ μὲν ὥσπερ κοινὰ πᾶσιν ἡ τοῖς πλείστοις τὰ δ' ἵδια κατὰ γένη. κοινὰ δὴ τό τε σκωληκοῦσθαι καὶ ἀστροβολεῖσθαι καὶ ὁ σφακελισμός. ἅπαντα γὰρ ὡς εἰπεῖν καὶ σκώληκας

¹ ἀποπληγῆ : ἀπολήγη conj. Sch.

² Plin. 17. 216. ³ cf. C.P. 5. 8. 3.

⁴ κατὰ γένη conj. W.; καὶ τὰ γένη UΜV; καὶ κατὰ γένη Ald.

third and fourth it becomes normal again and bears many fair clusters, so that it is quite as good as when it was in its prime. And when it goes off again,¹ they say one should dig on the other side and apply the same treatment; and that so treated the tree lasts for ever; and this should be done at intervals of about ten years. And this is why those who adopt this treatment never cut down the vine, but the same stems remain for many generations, so that even those who planted the trees cannot remember doing so. However perhaps one should enquire of those who have had experience before accepting this statement. These examples may serve for considering which trees are long-lived and which short-lived.

Of diseases and injuries done by weather conditions.

XIV. ² As to diseases—they say that wild trees are not liable to diseases which destroy them, but that they get into poor condition, and that most obviously when they are smitten with hail when either they are about to bud or are just budding or are in bloom; also when either a cold or a hot wind comes at such seasons: but that from seasonable storms, even if they be violent, they take no hurt,³ but rather that it is good for them all to be exposed to weather: for, unless they are, they do not grow so well. Cultivated kinds however, they say, are subject to various diseases, some of which are, one may say, common to all or to most, while others are special to particular kinds.⁴ General diseases are those⁵ of being worm-eaten, of being sun-scorched, and rot.⁶ All trees, it may be said,

⁵ κοινὰ δὴ τὸ τε conj. W.; κοινὰ καὶ τόπε UMV; κοινά· οἷον τόπε Ald. H. ⁶ cf. 8. 10. 1.

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ἴσχει πλὴν τὰ μὲν ἐλάττους τὰ δὲ πλείους, καθάπερ συκῆ μηλέα καὶ ἄπιος. ὡς δὲ ἀπλῶς εἰπεῖν ἥκιστα σκωληκοῦνται τὰ δριμέα καὶ ὀπώδη, καὶ ἀστροβολεῖται ὡσαύτως¹ μᾶλλον δὲ τοῖς νέοις ἡ τοῖς ἐν ἀκμῇ τοῦτο συμβαίνει, πάντων δὲ μάλιστα τῇ τε συκῆ καὶ τῇ ἀμπέλῳ.

3 'Η δ' ἐλάα πρὸς τῷ τοὺς σκώληκας ἴσχειν, οἱ δὴ καὶ τὴν συκῆν διαφθείρουσιν ἐντίκτοντες, φύει καὶ ἥλον² οἱ δὲ μύκητα καλοῦσιν, ἔνιοι δὲ λοπάδα³ τοῦτο δ' ἔστιν οἰον ἥλιον καῦσις. διαφθείρουνται δ' ἐνίοτε καὶ αἱ νέαι ἐλάαι διὰ τὴν ὑπερβολὴν τῆς πολυκαρπίας. ἡ δὲ ψώρα καὶ οἱ προσφυόμενοι κοχλίαι συκῆς εἰσιν οὐ πανταχοῦ δὲ τοῦτο συμβαίνει ταῖς συκαῖς, ἀλλ' ἔοικε καὶ τὰ νοσήματα γίνεσθαι κατὰ τοὺς τόπους, ὥσπερ τοῖς ζώοις· ἐπεὶ παρ' ἐνίοις οὐ ψωριῶσι, καθάπερ οὐδὲ περὶ τὴν Αἰνειαν.

4 Ἀλίσκεται δὲ συκῆ μάλιστα καὶ σφακελισμῷ καὶ κράδῳ. καλεῖται δὲ σφακελισμὸς μὲν ὅταν αἱ ρίζαι μελανθώσι, κράδος δ' ὅταν οἱ κλάδοι· καὶ γὰρ καλοῦσί τινες κράδους, ὅθεν καὶ τοῦνομα τῇ νόσῳ· ὁ δ' ἐρινέδος οὔτε κραδῷ οὔτε σφακελίζει οὔτε ψωριᾷ οὔτε σκωληκοῦται ταῖς ρίζαις ὁμοίως· οὐδὲ δὴ τὰ ἐρινά τινες ἀποβάλλουσιν οὐδὲ ἐὰν ἐμφυτευθώσιν εἰς συκῆν.

¹ ὀπώδη U M V Ald.; εὐώδη H., evidently from Plin. 17. 221. cf. C. P. 5. 9. 4 and 5.

² λοπάδα: Plin. 17. 223, *patella*. The ἥλος is an abortive bud, called in Italian *novolo*.

³ ἥλιον καῦσις conj. Scal. from Plin. l.c. *veluti solis exustio*: so also G; ἥλοιαντον U; ἥλοι αὐτὸν V; ἥλοι αὐτῶν M; ἥλοι αὐτῶν Ald. which W. prints provisionally.

have worms, but some less, as fig and apple, some more, as pear. Speaking generally, those least liable to be worm-eaten are those which have a bitter acrid¹ juice, and these are also less liable to sun-scorch. Moreover this occurs more commonly in young trees than in those which have come to their strength, and most of all it occurs in the fig and the vine.

The olive, in addition to having worms (which destroy the fig too by breeding in it), produces also a 'knot' (which some call a fungus, others a bark-blister²), and it resembles the effect of sun-scorch.³ Also sometimes young olives are destroyed by excessive fruitfulness. The fig is also liable to scab, and to snails which cling to it. However this does not happen to figs everywhere, but it appears that, as with animals, diseases are dependent on local conditions; for in some parts, as about Aineia,⁴ the figs do not get scab.

The fig is also often a victim to rot and to *krados*. It is called rot when the roots turn black, it is called *krados* when the branches do so; for some call the branches *kradoi*⁵ (instead of *kladoi*), whence the name is transferred to the disease. The wild fig does not suffer from *krados* rot or scab, nor does it get so worm-eaten in its roots⁶ as the cultivated tree; indeed some wild figs do not even shed their early fruit—not even if they are grafted⁷ into a cultivated tree.

⁴ cf. 5. 2. 1. ⁵ Evidently a dialectic form.

⁶ *βίζαις* PAld.; *συκαῖς* W. after conj. of Sch.

⁷ *ἔμφυτευθῶσιν* conj. Sch.; *ἔνι φυτ.* UMV; *ἔνια φυτ.* Ald. Apparently the object of such grafting was the 'caprifcation' of the cultivated tree (cf. 2. 8. 3); but grafting for this purpose does not seem to be mentioned elsewhere.

THEOPHRASTUS

5 Ἡ δὲ ψώρα μάλιστα γίνεται ὅταν ὕδωρ ἐπὶ Πλειάδι γένηται μὴ πολύ· ἐὰν δὲ πολύ, ἀποκλύζεται· συμβαίνει δὲ τότε καὶ τὰ ἔρινὰ ἀπορρεῖν καὶ τοὺς ὄλύνθους. τῶν δὲ σκωλήκων τῶν ἐν ταῖς συκαῖς οἱ μὲν ἐξ αὐτῆς γίνονται οἱ δὲ ἐντίκτονται ὑπὸ τοῦ καλουμένου κεράστου· πάντες δὲ εἰς κεράστην ἀποκαθίστανται· φθέγγονται δὲ οἷον τριγμόν. νοσεῖ δὲ συκῆ καὶ ἐὰν ἐπομβρία γένηται· τά τε γὰρ πρὸς τὴν ρίζαν καὶ αὐτὴ ἡ ρίζα ὕσπερ μαδῷ· τοῦτο δὲ καλοῦσι λοπᾶν.

6 ἡ δὲ ἄμπελος τραγᾶ· τοῦτο δὲ μάλιστα αὐτῆς ἐστι πρὸς τῷ ἀστροβολεῖσθαι, ἡ δὲ ταν ὑπὸ πνευμάτων βλαστοκοπηθῆ ἡ δὲ ταν τῇ ἐργασίᾳ συμπάθη ἡ τρίτον ὑπτία τμηθῆ.

‘Ρυὰς δὲ γίνεται, δὲ καλοῦσί τινες ψίνεσθαι, ὅταν ἐπιυιφθῆ κατὰ τὴν ἀπάνθησιν ἡ δὲ ταν κρειττωθῆ· τὸ δὲ πάθος ἐστὶν ὕστε ἀπορρεῖν τὰς ράγας καὶ τὰς ἐπιμενούσας εἰναὶ μικράς. ἔνια δὲ καὶ ριγώσαντα νοσεῖ, καθάπερ ἡ ἄμπελος· ἀμβλοῦνται γὰρ οἱ ὀφθαλμοὶ τῆς πρωτοτόμου· καὶ πάλιν ὑπερθερμανθέντα· ζητεῖ γὰρ καὶ τούτων τὴν συμμετρίαν ὕσπερ καὶ τῆς τροφῆς. ὅλως δὲ πᾶν τὸ παρὰ φύσιν ἐπικίνδυνον.

¹ cf. C.P. 5. 9, 10; Col. 5. 9, 15.

² cf. 5. 4, 5; C.P. 5. 10, 5; Plin. 17. 221.

³ αὐτὴ ἡ ρίζα I conj.; αὐτὴν τὴν ρίζαν U; om. Ald.

⁴ cf. C.P. 5. 9, 12; Plin. 17. 225.

⁵ i.e. shedding of the ‘bark’ of the roots. λοπᾶν conj. Sch., cf. C.P. 5. 9, 9; λοπᾶδα Ald. H., cf. 4. 14, 3; but the word here points to a different disease.

⁶ ὑπτία τομή seems to be a technical term for pruning in such a way that the growth of the new wood is encouraged

ENQUIRY INTO PLANTS, IV. xiv. 5-6

Scab¹ chiefly occurs when there is not much rain after the rising of the Pleiad ; if rain is abundant, the scab is washed off, and at such times it comes to pass that both the spring and the winter figs drop off. Of the worms found in fig-trees some have their origin in the tree, some are produced in it by the creature called the 'horned worm' ; but they all turn into the 'horned worm' ;² and they make a shrill noise. The fig also becomes diseased if there is heavy rain ; for then the parts towards the root and the root itself³ become, as it were, sodden,⁴ and this they call 'bark-shedding.'⁵ The vine suffers from over-luxuriance ; this, as well as sun-scorch, specially happens to it either when the young shoots are cut by winds, or when it has suffered from bad cultivation, or, thirdly, when it has been pruned upwards.⁶

The vine becomes a 'shedder,'⁷ a condition which some call 'casting of the fruit,' if the tree is snowed upon at the time when the blossom falls, or else when it becomes over lusty ;⁸ what happens is that the unripe grapes drop off, and those that remain on the tree are small. Some trees also contract disease from frost, for instance the vine ; for then the eyes of the vine that was pruned early become abortive ; and this also happens from excessive heat, for the vine seeks regularity in these conditions too, as in its nourishment. And in general anything is dangerous which is contrary to the normal course of things.

and so there is less fruit : exact sense obscure ; ? 'from below' (i.e. with the blade of the knife pointing upwards). cf. *C.P. l.c.*; Col. 4. 24. 15 ; Plin. *l.c.*, *in supinum excisis*.

⁷ cf. *C.P.* 5. 9. 13.

⁸ *κρείττωθῆ* : i.e. the growth is over-luxuriant. The word occurs elsewhere only in the parallel passage *C.P. l.c.*, where occurs also the subst. *κρείττωσις*, evidently a technical term.

THEOPHRASTUS

7 Μεγάλα δὲ ξυμβάλλεται καὶ τὰ τραύματα καὶ αἱ πληγαὶ τῶν περισκαπτόντων εἰς τὸ μὴ φέρειν τὰς μεταβολὰς ἢ καυμάτων ἢ χειμώνων· ἀσθενὲς γὰρ δὲν διὰ τὴν ἔλκωσιν καὶ τὸν πόνον εὐχειρωτότατόν ἐστι ταῖς ὑπερβολαῖς. σχεδὸν δέ, ὡς τινες οἴονται, τὰ πλεῖστα τῶν νοσημάτων ἀπὸ πληγῆς γίνεται· καὶ γὰρ τὰ ἀστροβλητα καλούμενα καὶ τὰ σφακελίζοντα διὰ τὸ ἀπὸ ταύτης εἶναι τῶν ριζῶν τὸν πόνον. οἴονται δὲ καὶ δύο ταύτας εἶναι μόνας νόσους· οὐ μὴν ἀλλὰ τοῦτο γ' οὐκ ἄγαν ὀμολογούμενόν ἐστι.

[Πάντων δ' ἀσθενέστατον ἡ μηλέα ἡ ἡρινὴ καὶ τούτων ἡ γλυκεῖα.]

8 "Ενιαὶ δὲ πηρώσεις οὐκ εἰς φθορὰν γίνονται δλῶν ἀλλ' εἰς ἀκαρπίαν· οἶον ἐάν τις τῆς πίτυος ἀφέλη τὸ ἄκρον ἢ τοῦ φοίνικος, ἀκαρπα γίνεσθαι ἄμφω δοκεῖ καὶ οὐχ δλῶς ἀναιρεῖσθαι.

Γίνονται δὲ νόσοι καὶ τῶν καρπῶν ἀντῶν, ἐὰν μὴ κατὰ καιρὸν τὰ πνεύματα καὶ τὰ οὐράνια γένηται· συμβαίνει γὰρ ὅτε μὲν ἀποβάλλειν γενομένων ἢ μὴ γενομένων ὑδάτων, οἷον τὰς συκᾶς, ὅτε δὲ χείρους γίνεσθαι σηπομένους καὶ καταπιγομένους ἢ πάλιν ἀναξηραίνομένους παρὰ τὸ δέον. χείριστον δὲ ἐὰν ἀπανθοῦσί τισιν ἐφύση, καθάπερ ἐλάα καὶ ἀμπέλῳ· συναπορρεῖ γὰρ ὁ καρπὸς δι' ἀσθένειαν.

¹ Plin. 17. 227.

² εὐχειρωτάτων conj. W. after Lobeck; εὐχειρύτατων Ald.

³ πόνον conj. H. from G; τόπον MVAld.

⁴ This sentence is clearly out of place: the plural *τούτων* has nothing to refer to. cf. 4. 13. 2. It is represented however by Plin. l.c.

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¹ Moreover the wounds and blows inflicted by men who dig about the vines render them less able to bear the alternations of heat and cold ; for then the tree is weak owing to the wounding and to the strain put upon it, and falls an easy prey² to excess of heat and cold. Indeed, as some think, most diseases may be said to be due to a blow ; for that even the diseases known as 'sun-scorch' and 'rot' occur because the roots have suffered in this way.³ In fact they think that there are only these two diseases ; but there is not general agreement on this point.

The 'spring apple' and especially the sweet form of it, has the weakest constitution.⁴

⁵ Some mutilations however do not cause destruction of the whole⁶ tree, but only produce barrenness ; for instance, if one takes away the top of the Aleppo pine or the date-palm, the tree in both cases appears to become barren, but not to be altogether destroyed.

There are also diseases of the fruits themselves, which occur if the winds and rains do not come in due season. For it comes to pass⁷ that sometimes trees, figs, for example, shed their fruit when rain does or does not come, and⁸ sometimes the fruit is spoilt by being rotted and so choked off,⁹ or again by being unduly dried up. It is worst of all for some trees, as olive and vine, if rain falls on them as they are dropping their blossom ;¹⁰ for then the fruit, having no strength, drops also.

⁵ Plin. 17. 228 and 229.

⁶ $\delta\lambda\omega\nu$ conj. W. ; $\tau\iota\nu\omega\nu$ P₂Ald.H. cf. C.P. 5. 17. 3 and 6.

⁷ cf. C.P. 5. 10. 5.

⁸ $\delta\epsilon$ add. Sch. ⁹ cf. C.P. l.c.

¹⁰ $\alpha\pi\alpha\nu\thetao\nu\sigma\iota$ conj. Sch. from G and Plin. l.c. ; $\epsilon\pi\alpha\nu\thetao\nu\sigma\iota$ Ald.H.

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9 Ἐν Μιλήτῳ δὲ τὰς ἐλάας, ὅταν ὡσι περὶ τὸ ἀνθεῖν, κάμπαι κατεσθίουσιν, αἱ μὲν τὰ φύλλα αἱ δὲ τὰ ἄνθη, ἔτεραι τῷ γένει, καὶ ψιλοῦσι τὰ δένδρα· γίνονται δὲ ἐὰν ἡ νότια καὶ εὐδιεινά· ἐὰν δὲ ἐπιλάβῃ καύματα ρήγνυνται.

Περὶ δὲ Τάραντα προφαίνουσι μὲν ἀεὶ πολὺν καρπόν, ὑπὸ δὲ τὴν ἀπανθησιν τὰ πολλά ἀπόλλυται. τὰ μὲν οὖν τοιαῦτα τῶν τόπων ἔδια.

10 Γίνεται δὲ καὶ ἄλλο νόσημα περὶ τὰς ἐλάας ἀράχνιον καλούμενον· φύεται γὰρ τοῦτο καὶ διαφθείρει τὸν καρπόν. ἐπικάει δὲ καὶ καύματά τινα καὶ ἐλάαν καὶ βότρυν καὶ ἄλλους καρπούς. οἱ δὲ καρποὶ σκωληκοῦνται τινῶν, οἷον ἐλάας ἀπίου μηλέας μεσπιλῆς ρόας. καὶ ὅ γε τῆς ἐλάας σκώληξ ἐὰν μὲν ὑπὸ τὸ δέρμα γένηται διαφθείρει τὸν καρπόν, ἐὰν δὲ τὸν πυρῆνα διαφάγη ὠφελεῖ. κωλύεται δὲ ὑπὸ τῷ δέρματι εἶναι ὑδατος ἐπ' Ἀρκτούρῳ γενομένου. γίνονται δὲ καὶ ἐν ταῖς δρυπεπέσι σκώληκες, αἴπερ καὶ χείρους εἰς τὴν ρύσιν· ὅλως δὲ καὶ δοκοῦσιν εἶναι σαπραί· δι' ὃ καὶ γίνονται τοῖς νοτίοις καὶ μᾶλλον ἐν τοῖς ἐφύδροις. ἐγγίνονται δὲ καὶ κυνῆπες ἐν τισι τῶν δένδρων, ὡσπερ ἐν τῇ δρυὶ καὶ τῇ συκῇ· καὶ δοκοῦσιν ἐκ τῆς ὑγρότητος συνίστασθαι τῆς ὑπὸ τὸν φλοιὸν συνισταμένης· αὕτη δέ ἐστι γλυκεῖα γενομένοις. γίνονται δὲ καὶ ἐν λαχάνοις τισίν,

¹ cf. C.P. 5. 10. 3.

² Tarentum: cf. C.P. l.c.

³ ἀπάνθησιν conj. W.; ἀνθησιν Ald.

⁴ Plin. 17. 229-231.

⁵ ἀράχνιον conj. Sch. after Meurs.; ἀρίχνιον UP₂; ἀρχίχνιον MVP; ἀρχίνιον Ald. cf. C.P. 5. 10. 2.

¹ In Miletus the vines at the time of flowering are eaten by caterpillars, some of which devour the flowers, others, a different kind, the leaves; and they strip the tree; these appear if there is a south wind and sunny weather; if the heat overtakes them, the trees split.

About Taras² the olives always shew much fruit, but most of it perishes at the time when the blossom falls.³ Such are the drawbacks special to particular regions.

⁴ There is also another disease incident to the olive, which is called cobweb;⁵ for this forms⁶ on the tree and destroys the fruit. Certain hot⁷ winds also scorch both olive vine-cluster and other fruits. And the fruits of some get worm-eaten,⁸ as olive pear apple medlar pomegranate. Now the worm which infests the olive, if it appears below the skin, destroys the fruit; but if it devours the stone it is beneficial. And it is prevented from appearing under the skin if there is rain after⁹ the rising of Arcturus. Worms also occur in the fruit which ripens on the tree, and these are more harmful as affecting the yield of oil. Indeed these worms seem to be altogether rotten; wherefore they appear when there is a south wind and particularly in damp places. The *knips*¹⁰ also occurs in certain trees, as the oak and fig, and it appears that it forms from the moisture which collects under the bark, which is sweet to the taste. Worms also occur¹¹ in some

⁶ φύεται Ald.; ἐμφύεται conj. Sch. from *C.P. l.c.*, but the text is perhaps defective.

⁷ cf. *C.P.* 5. 10. 5. ⁸ cf. *C.P.* 5. 10. 1.

⁹ ἐπ' conj. Sch., cf. *C.P.* 5. 10. 1; ὑπ' U; ἀπ' Ald. H.

¹⁰ cf. 2. 8. 3.

¹¹ The subject of γίνονται is probably σκάληκες, not κνῆκες.

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ἔνθα δὲ κάμπαι διαφερούσης δῆλον ὅτι τῆς ἀρχῆς.

11 Καὶ τὰ μὲν νοσήματα σχεδὸν ταῦτα καὶ ἐν τούτοις ἔστιν. ἔνια δὲ πάθη τῶν κατὰ τὰς ὥρας καὶ τῶν κατὰ τοὺς τόπους γινομένων ἀναιρεῖν πέφυκεν, ἀ οὐκ ἄν τις εἴποι νόσους, οίον λέγω τὴν ἔκπηξιν καὶ δὲ καλοῦσί τινες καυθμόν. ἄλλα δὲ παρ' ἔκάστοις πέφυκε πνεύματα ἀπολλύναι καὶ ἀποκάειν οίον ἐν Χαλκίδι τῆς Εύβοίας Ὀλυμπίας ὅταν πνεύσῃ μικρὸν πρὸ τροπῶν ἡ μετὰ τροπὰς χειμερινὰς ψυχρός· ἀποκάει γὰρ τὰ δένδρα καὶ οὕτως αὐτὰ ποιεῖ καὶ ξηρὰ ὡς οὐδὲ ἀν ὑφ' ἡλίου καὶ χρόνου πολλοῦ γένοιτ' ἄν, δι' δὲ καὶ καλοῦσι καυθμόν· ἐγένετο δὲ πρότερον πολλάκις ἥδη καὶ ἐπ' Ἀρχίππου δι' ἐτῶν τετταράκοντα σφοδρός.

12 Πονοῦσι δὲ μάλιστα τῶν τόπων οἱ κοῖλοι καὶ οἱ αὐλῶνες καὶ ὅσοι περὶ τοὺς ποταμοὺς καὶ ἀπλῶς οἱ ἀπνευστότατοι· τῶν δένδρων δὲ μάλιστα συκῆ, δεύτερον δὲ ἐλάα. ἐλάας δὲ μᾶλλον ὁ κότινος ἐπόνησεν ἴσχυρότερος ὡν, δὲ καὶ θαυμαστὸν ἥν· αἱ δὲ ἀμυγδαλαῖ τὸ πάμπαν ἀπαθεῖς· ἀπαθεῖς δὲ καὶ αἱ μηλέαι καὶ αἱ ἄπιοι καὶ αἱ ρόαι ἐγένοντο· δι' δὲ καὶ τοῦτο ἥν θαυμαστόν. ἀποκάεται δὲ εὐθὺς ἐκ τοῦ στελέχους, καὶ ὅλως δὲ μᾶλλον καὶ πρότερον ὡς εἰπεῖν ἀπτεται <τὰ ἄνω> τῶν κάτω. φανερὰ δὲ γίνεται τὰ μὲν ἄμα περὶ τὴν βλάστησιν,

¹ Plin. 17. 232.

² τῶν κατὰ τοὺς τόπους conj. Sch. from Plin. l.c.; τῶν καθ' αὐτὰ Ald.

³ ἔκπηξιν conj. Sch.; ἔκπληξιν UMP₂ Ald. cf. C.P. 5. 12. 2, πῆξις.

⁴ cf. C.P. 5. 12. 4.

pot-herbs, as also do caterpillars, though the origin of these is of course different.

Such are in general the diseases, and the plants in which they occur. Moreover¹ there are certain affections due to season or situation² which are likely to destroy the plant, but which one would not call diseases: I mean such affections as freezing³ and what some call 'scorching.' Also⁴ there are winds which blow in particular districts that are likely to destroy or scorch; for instance the 'Olympian' wind of Chalcis in Euboea, when it blows cold a little before or after the winter solstice; for this wind scorches up the trees and makes them more dry and withered than they would become from the sun's heat even in a long period; wherefore its effect is called 'scorching.' In old times it occurred very frequently, and it recurred with great violence in the time of Archippus, after an interval of forty years.

⁵ The places which suffer most in this way are hollow places, valleys, the ground near rivers, and, in general, places which are least open to wind; the tree which suffers most is the fig, and next to that the olive. The wild olive, being stronger, suffered more than the cultivated tree, which was surprising. But the almonds were altogether unscathed, as also were the apples pears and pomegranates; wherefore this too was a surprising fact. The tree gets scorched by this wind right down to the trunk, and in general the upper are caught more and earlier than the lower parts.⁶ The effects are seen partly at the actual

⁵ cf. C.P. 5. 12. 7; Plin. 17. 232 and 233.

⁶ κάτω UMVP; &νω W. after Sch.'s conj.: text probably defective; I have added τὰ &νω. cf. C.P. 5. 12. 5.

ἡ δὲ ἐλάα διὰ τὸ ἀείφυλλον ὕστερον ὅσαι μὲν οὖν ἀν φυλλοβολήσωσιν ἀναβιώσκονται πάλιν, ὅσαι δὲ ἀν μὴ τελέως ἀπόλλυνται. παρ' ἐνίοις δέ τινες ἀποκαυθεῖσαι καὶ τῶν φύλλων αὐναυθέντων ἀνεβλάστησαν πάλιν ἄνευ τοῦ ἀποβαλεῖν καὶ τὰ φύλλα ἀνεβίωσεν. ἐνιαχοῦ δὲ καὶ πολλάκις τοῦτο συμβαίνει, καθάπερ καὶ ἐν Φιλίπποις.

13 Τὰ δὲ ἐκπαγέντα, ὅταν μὴ τελέως ἀπόληται, τάχιστα ἀναβλαστάνει, ὥστε εὐθὺς τὴν ἀμπελον καρποφορεῖν, ὥσπερ ἐν Θετταλίᾳ. ἐν δὲ τῷ Πόντῳ περὶ Παντικάπαιον αἱ μὲν ἐκπήξεις γίνονται διχῶς, ὅτε μὲν ὑπὸ ψύχους ἐάν χειμέριον ἡ τὸ ἔτος, ὅτε δὲ ὑπὸ πάγων ἐάν γε πολὺν χρόνον διαμένωσι. ἀμφότερα δὲ μάλιστα γίγνονται μετὰ τροπὰς περὶ τὰς τετταράκοντα. γίνονται δὲ οἱ μὲν πάγοι ταῖς αἰθρίαις, τὰ δὲ ψύχη μάλιστα ὑφ' ὧν ἡ ἐκπήξις ὅταν αἰθρίας οὔσης αἱ λεπίδες καταφέρωνται. ταῦτα δὲ ἐστὶν ὥσπερ τὰ ἔνσημα πλὴν πλατύτερα, καὶ φερόμενα φανερὰ πεσόντα δὲ οὐ διαμένει· περὶ δὲ τὴν Θράκην ἐκπήγυνυνται.

14 Ἀλλὰ γὰρ αἱ μὲν νόσοι πόσαι τε καὶ ποῖαι καὶ τίνες γίνονται καὶ πάλιν αἱ δι' ὑπερβολὴν χειμῶνος ἡ καυμάτων φθοραὶ καὶ αἱ διὰ πινευμάτων ψυχρότητα ἡ θερμότητα διὰ τούτων θεωρείσθωσαν· ὡν ἐνίας οὐθὲν ἀν κωλύοι καὶ τοῖς ἀγρίοις εἶναι κοινὰς καὶ κατὰ τὴν ὅλην τῶν δένδρων φθορὰν καὶ ἔτι μᾶλλον κατὰ τὴν τῶν καρπῶν· δὲ καὶ συμβαίνον ὄρῶμεν· οὐκ εὐκαρπεῖ

¹ Plin. 17. 233.

² ἐκπαγέντα conj. Sch.; ἐκπλαγέντα U; ἐκπληγέντα Ald.

³ ἐάν γε conj. Sch.; ἐάν δὲ U; ἐάν π. χ. δ. γε Ald.

time of budding, but in the olive, because it is evergreen, they do not appear till later; those trees therefore which have shed their leaves come to life again, but those that have not done so are completely destroyed. In some places trees have been known, after being thus scorched and after their leaves have withered, to shoot again without shedding their leaves, and the leaves have come to life again. Indeed in some places, as at Philippi, this happens several times.

¹ Trees which have been frost-bitten,² when they are not completely destroyed, soon shoot again, so that the vine immediately bears fruit, for instance in Thessaly. In Pontus near Panticapaeum the frost-bite occurs in two ways, either just from cold, if the season is wintry, or from long³ spells of frost; in either case this generally occurs in the⁴ forty days after the winter solstice. The frosts occur in fine weather, but the cold spells, which cause the frost-bite, chiefly when in fine weather the 'flakes'⁵ fall; these are like filings, but broader, and can be seen as they fall, but when they have fallen, they disappear—though in Thrace they freeze solid.

Let this suffice for consideration of the diseases, their number and nature, including the fatal effects of excessive cold and heat or of cold or hot winds. And it may well be that certain of these also affect wild trees, producing entire destruction of the tree and still more that of the fruit. Indeed we see this actually happen; for wild trees also often fail to

⁴ πεπλ conj. Sch., cf. C.P. 5. 12. 4; μετὰ UMVALd.

⁵ λεπίδες conj. Scal. from G (*squamulae*); βεπίδες Ald. cf. Hdt. 4. 31.

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γὰρ οὐδὲ ἐκεῖνα πολλάκις, ἀλλ’ οὐχ ὁμοίως οἷμαι παρατετήρηται.

XV. Λοιπὸν δ’ εἰπεῖν ὅσα παραιρουμένων τινῶν μορίων ἀπόλλυται. κοινὴ μὲν δὴ πᾶσι φθορὰ τοῦ φλοιοῦ περιαιρεθέντος κύκλῳ πᾶν γὰρ ὡς εἰπεῖν οὕτως ἀπόλλυσθαι δοκεῖ πλὴν ἀνδράχλη· καὶ αὗτη δὲ ἐάν τις τὴν σάρκα σφόδρα πιέσῃ καὶ τὸν μέλλοντα βλαστὸν διακόψῃ· πλὴν εἰ ἄρα φελλοῦ· τοῦτον γάρ φασι καὶ εὐσθενεῖν μᾶλλον περιαιρουμένου δῆλον ὅτι τοῦ ἔξω καὶ τοῦ κάτω πρὸς τὴν σαρκί, καθάπερ καὶ τῆς ἀνδράχλης. ἐπεὶ καὶ τοῦ κεράσου περιαιρεῖται καὶ τῆς ἀμπέλου καὶ τῆς φιλύρας, ἔξ οὖ τὰ σχοινία, καὶ μαλάχης τῶν ἐλαττόνων, ἀλλ’ οὐχ ὁ κύριος οὐδὲ ὁ πρῶτος, ἀλλ’ ὁ ἐπιπολῆς, δις καὶ αὐτόματος ἐνίστεται ἀποπίπτει διὰ τὴν ὑπόφυσιν θατέρου.

2 Καὶ γὰρ φλοιορραγὴ ἔνια τῶν δένδρων ἐστίν, ὥσπερ καὶ ἡ ἀνδράχλη καὶ ἡ πλάτανος. ὡς δέ τινες οἴονται, πάλιν ὑποφύεται νέος, ὁ δὲ ἔξωθεν ἀποξηραίνεται καὶ ρήγνυται καὶ αὐτόματος ἀποπίπτει πολλῶν, ἀλλ’ οὐχ ὁμοίως ἐπίδηλος. φθείρονται μὲν οὖν, ὡς οἴονται, πάντα περιαιρουμένου, διαφέρει δὲ τῷ θάττον καὶ βραδύτερον καὶ

¹ Plin. 17. 234; cf. C.P. 5. 15. 1.

² cf. 1. 5. 2.

³ βλαστὸν conj. Sch. from G; καρπὸν U Ald. H.

⁴ Plin. 17. 234-236.

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produce a good crop of fruit ; but, I imagine, they have not been so well observed.

Of the effects on trees of removing bark, head, heart-wood, roots, etc.; of various causes of death.

XV. ¹ Next we must mention what trees perish when certain parts are removed. All perish alike, if the bark is stripped off all round ; one may say that every tree, except the andrachne,² perishes under these circumstances ; and this tree does so also, if one does violence to the flesh, and so breaks off the new growth³ which is forming. However one should perhaps except the cork-oak ; for this, they say, is all the stronger if its bark is stripped off, that is, the outer bark and also that which lies below it next the flesh—as with the andrachne. For the bark is also stripped from the bird-cherry the vine and the lime (and from this the ropes are made), and, among smaller plants, from the mallow ; but in these cases it is not the real nor the first bark which is taken, but that which grows above that, which even of its own accord sometimes falls off because fresh bark is forming underneath.

⁴ In fact some trees, as andrachne and plane, have a bark which cracks.⁵ As some think, in many cases a new bark forms⁶ underneath, while the outer bark withers and cracks and in many cases falls off of its own accord ; but the process is not so obvious as it is in the above mentioned cases. Wherefore, as they think, all trees are destroyed by stripping the bark, though the destruction is not in all cases equally

¹ cf. C.P. 3. 18. 3. φλοιορραγή έντα conj. Mold.; φλοιορραγία μία UMV; φυλλορογία μία Ald.

² ὄποφύεται conj. W.; ὄποφύει Ald.H.

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μᾶλλον καὶ ἡπτον. ἔνια γὰρ πλείω χρόνον δια-
μένει, καθάπερ συκῆ καὶ φίλυρα καὶ δρῦς· οἱ δὲ
καὶ ζῆν φασι ταῦτα, ζῆν δὲ καὶ πτελέαν καὶ
φοίνικα· τῆς δὲ φιλύρας καὶ συμφύεσθαι τὸν
φλοιὸν πλὴν μικροῦ· τῶν δὲ ἄλλων οἰνού πωροῦ-
σθαι καὶ ἴδιαν τινὰ φύσιν ἔχειν. βοηθεῖν δὲ
πειρῶνται διαπλάττοντες πηλῷ καὶ περιδούντες
φλοιοῖς καὶ καλάμοις καὶ τοῖς τοιούτοις, δπως μὴ
ψύχηται μηδ ἀποξηραίνηται. καὶ ηδη φασί που
ἀναφῦναι, καθάπερ καὶ ἐν Ἡρακλείᾳ τῇ Τραχινίᾳ,
3 τὰς συκᾶς. δεῖ δὲ ἄμα τῇ τῆς χώρας ἀρετῇ καὶ
τῇ τοῦ ἀέρος κράσει καὶ τὰ ἐπιγυγνόμενα τοιαῦτα
εἶναι· χειμώνων γὰρ ἡ καυμάτων ἐπιγυινομένων
σφοδρῶν εὐθὺς ἀπόλλυνται· διαφέρουσι δὲ καὶ
αἱ ὥραι· περὶ γὰρ τὴν βλάστησιν ἐλάτης ἡ
πεύκης, δτε καὶ λοπῶσι, τοῦ Θαργηλιῶνος ἡ
Σκιρροφοριῶνος ἄν τις περιέλη, παραχρῆμα ἀπ-
όλλυνται. τοῦ δὲ χειμῶνος πλείω χρόνον ἀντ-
έχει καὶ ἔτι μᾶλλον τὰ ἰσχυρότατα, καθάπερ πρῖ-
νος καὶ δρῦς· χρονιωτέρα γὰρ ἡ τούτων φθορά.
4 δεῖ δὲ καὶ τὴν περιαιρεσιν ἔχειν τι πλάτος,
πάντων μὲν μάλιστα δὲ τῶν ἰσχυροτάτων· ἐπεὶ
ἄν τις μικρὰν παντελῶς ποιήσῃ, οὐθὲν ἄτοπον τὸ
μὴ ἀπόλλυνσθαι· καίτοι φασί γέ τινες, ἐὰν ὄπ-
οσονοῦν, συμφθείρεσθαι πάντως· ἀλλ' ἐπὶ τῶν
ἀσθενεστέρων τοῦτ' εἰκός. ἔνια γὰρ κάν μη
κύκλῳ περιαιρεθῆ φθείρεσθαι φασιν, ἀ καὶ

¹ καὶ add. W. (text defective in MSS. except U).

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rapid or complete. Some in fact, as fig lime and oak, survive for some time ; indeed some say that these recover, and also the elm and date-palm, and that the bark even of the lime almost entirely closes up again, while in other trees it forms as it were a callus and¹ acquires a peculiar new character. Men try to help the tree by plastering it with mud and tying pieces of bark reeds or something of the kind about it, so that it may not take cold nor become dried up. And they say that the bark has been known to grow again ;² for instance that that of the fig-trees at the Trachinian Heraclea did so. However this does not only depend on the quality of the soil and on the climate ; the other circumstances which ensue must also be favourable ; for, if great cold or heat ensues, the tree perishes at once. The season also makes a difference. For if one strips the bark of a silver-fir or fir at the time when the buds are shooting during Thargelion or Skirrophorion,³ at which season it is separable, the tree dies at once. If it is done however in winter, the tree holds out longer ; and this is especially true of the strongest trees, such as kermes-oak and oak ; these it takes longer to kill. However the piece stripped off must be of a certain breadth to cause the death of the tree, especially in the case of the strongest trees ; for, if one does it only a little, it is not surprising that the tree should not be killed ; though some indeed say that, if it is done at all,⁴ the tree certainly dies ; this however is probably true only of the weaker kinds. For some, they say, if they are in bad barren

² ἀναφύναι conj. Scal. from G ; φύναι Ald. H.

³ May-June.

⁴ διποσονοῦν conj. Sch. from G ; διπωσοῦν Ald.

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λυπρὰν ἔχει χώραν καὶ ἄτροφον. αὕτη μὲν δή, καθάπερ εἴρηται, κοινὴ φθορὰ πάντων.

XVI. "Ην δὲ καλούσιν ἐπικοπὴν τῶν δένδρων, μόνον πεύκης ἐλάτης πίτυος φοίνικος, οἱ δὲ καὶ κέδρον καὶ κυπαρίττον φασί. ταῦτα γάρ, ἐὰν περιαιρεθῆ τὴν κόμην ἄνωθεν καὶ ἐπικοπῆ τὸ ἄκρον, φθείρεται πάντα καὶ οὐ βλαστάνει, καθάπερ οὐδὲ ἐπικαυθέντα ἢ πάντα ἢ ἔνια. τὰ δὲ ἄλλα πάντα καὶ περικοπέντα βλαστάνει, καὶ ἔνιά γε καλλίω γίνεται, καθάπερ ἡ ἐλάα. διαφθείρεται δὲ τὰ πολλὰ κάνει σχισθῆ τὸ στέλεχος· οὐδὲν γάρ ὑπομένειν δοκεῖ πλὴν ἀμπέλου καὶ συκῆς καὶ ρόας καὶ μηλέας· ἔνια δὲ κάνει ἐλκωθῆ καὶ μεῖζον καὶ βαθύτερον ἀπόλλυται. τὰ δὲ οὐδὲν πάσχει, καθάπερ ἡ πεύκη δᾳδουργουμένη, καὶ ἔξ ὧν δὴ τὰς ρήτινας συλλέγουσιν, οἷον ἐλάτης τερμίνθου· καὶ γάρ δὴ τούτων εἰς βάθος ἡ τρώσις καὶ ἐλκωσις. καὶ γάρ ἔξ ἀφόρων φοράδες γίνονται καὶ ἔξ ὀλιγοφόρων πολυνόμοι.

2 Τὰ δὲ καὶ πελέκησιν ὑπομένει καὶ ὁρθὰ καὶ πεσόντα ὑπὸ πνεύματος, ὥστε πάλιν ἀνίστασθαι καὶ ζῆν καὶ βλαστάνειν, οἷον ἴτέα καὶ πλάτανος. ὅπερ συνέβη καὶ ἐν Ἀντάνδρῳ καὶ ἐν Φιλίπποις· ἐκπεσούσης γάρ ὡς ἀπέκοψαν τοὺς ἀκρεμόνας καὶ ἐπελέκησαν, ἀνεφύη νύκτωρ ἡ πλάτανος κουφισθεῖσα τοῦ βάρους καὶ ἀνεβίω καὶ ὁ φλοιὸς περιέψει πάλιν. παραπελεκημένη δὲ ἐτύγχανεν ἐκ τῶν δύο μερῶν· ἦν δὲ τὸ δένδρον μέγα μῆκος

¹ Plin. 17. 236; cf. 3. 7. 2; C.P. 5. 17. 3.

² cf. 3. 9. 5.

³ ἄνωθεν καὶ conj. W.: καὶ ἄνωθεν Ald.

⁴ cf. 1. 3. 3; 1. 14. 2.

soil, die even if the bark is not stripped all round. This then, as has been said, is a universal cause of death.

XVI. ¹ The process which is called topping of trees is fatal only to fir silver-fir Aleppo pine² and date-palm, though some add prickly cedar and cypress. These, if they are stripped of their foliage at the top³ and the crown is cut off, perish wholly and do not shoot again, as is the case with some, if not with all, if they are burnt. But all other trees shoot again after being lopped, and some, such as the olive,⁴ become all the fairer. However most trees perish if the stem is split;⁵ for no tree seems able to stand this, except vine fig pomegranate and apple; and some perish even if they are wounded severely and deeply. Some however take no harm⁶ from this, as the fir when it is cut for tar, and those trees from which the resins are collected, as silver-fir and terebinth; though these trees are in fact then deeply wounded and mangled. Indeed they actually become fruitful⁷ instead of barren, or are made to bear plentifully instead of scantily.

Some trees again submit to being hewn both when they are standing and when they have been blown down, so that they rise up again and live and shoot, for instance the willow and the plane.⁸ This was known to happen in Antandros and at Philippi; a plane in Antandros having fallen and had its boughs lopped off and the axe applied to its trunk, grew again in the night when thus relieved of the weight, and the bark grew about it again. It happened that it had been hewn two thirds of the way round; it

⁵ cf. C.P. 5. 16. 4; Plin. 17. 238.

⁷ φορδεῖς conj. Sch.; φορίδες Ald.

⁶ cf. C.P. 5. 16. 2.

⁸ Plin. 16. 133.

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μὲν μεῖζον ἡ δεκάπηχυ, πάχος δ' ὥστε μὴ ραδίως
 3 ἀν περιλαβεῖν τέτταρας ἄνδρας. ἡ δὲ ἐν Φιλίπ-
 ποις ἵτεα περιεκόπη μὲν τοὺς ἀκρεμόνας, οὐ μὴν
 παρεπελεκήθη. μάντις δέ τις ἔπεισεν αὐτοὺς
 θυσίαν τε ποιεῖσθαι καὶ τηρεῖν τὸ δένδρον ὡς
 σημείον ἀγαθὸν γεγονός. ἀνέστη δὲ καὶ ἐν
 Σταγείροις ἐν τῷ μουσείῳ λεύκη τις ἐκπεσοῦσα.

4 Τῆς δὲ μήτρας ἔξαιρουσμένης οὐθὲν ὡς εἰπεῖν
 φθείρεται δένδρον. σημεῖον δὲ ὅτι πολλὰ κοῦλα
 τῶν μέγεθος ἔχόντων δένδρων ἔστιν. οἱ δὲ περὶ
 Ἀρκαδίαν φασὶ μέχρι τινὸς μὲν ζῆν τὸ δένδρον,
 τελέως δὲ ἔξ ἅπαντος ἔξαιρεθείσης καὶ πεύκην
 φθείρεσθαι καὶ ἐλάτην καὶ ἄλλο πᾶν.

5 Κοινὴ δὲ φθορὰ πάντων κὰν αἱ ρίζαι περι-
 κοπῶσιν ἡ πᾶσαι ἡ αἱ πλεῖσται καὶ μέγισται
 καὶ κυριώταται τοῦ ζῆν. αὗται μὲν οὖν ἔξ
 ἀφαιρέσεως.

‘Η δ' ὑπὸ τοῦ ἐλαίου προσθέσει τινὶ μᾶλλον ἡ
 ἀφαιρέσει· πολέμιον γὰρ δὴ καὶ τοῦτο πᾶσι· καὶ
 ἐλαιον ἐπιχέουσι τοῖς ὑπολείμμασι τῶν ρίζῶν.
 ἵσχύει δὲ μᾶλλον τὸ ἐλαιον ἐν τοῖς νέοις καὶ ἄρτι
 φυομένοις· ἀσθενέστερα γάρ, δι' ὃ καὶ ἀπτεσθαι
 κωλύουσι.

Φθορὰ δὲ καὶ ὑπὸ ἀλλήλων εἰσὶ τῷ παραι-
 ρεῖσθαι τὰς τροφὰς καὶ ἐν τοῖς ἄλλοις ἐμποδίζειν.
 χαλεπὸς δὲ καὶ ὁ κιττὸς παραφυόμενος, χαλεπὸς
 δὲ καὶ ὁ κύτισος· ἀπόλλυσι γὰρ πάνθ' ὡς εἰπεῖν.

¹ τινὸς μὲν ζῆν τὸ δ. conj. W.; τινος ἐὰν (corrected) τοῦ δένδρου
 U; τινος ἐξηρέθη τοῦ δ. MVAld.

² cf. Plin. 17. 234; C.P. 5. 15. 6.

³ πᾶσι· καὶ ἐλαιον ἐπιχέουσι conj. Sch.; πᾶσιν ἐλαιον ἐπιχεύ-
 ουσιν UMP₂Ald.

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was a large tree, more than ten cubits high, and of such girth that four men could not easily have encircled it. The willow at Philippi which grew again had had its branches lopped off, but the trunk had not been hewn. A certain seer persuaded the people to offer sacrifice and take care of the tree, since what had occurred was a good omen. Also at Stageira an abele in the school gardens which had fallen got up again.

Hardly any tree is destroyed by taking out the core ; a proof of which is the fact that many large trees are hollow. The people of Arcadia say that the tree under these circumstances lives for a time,¹ but that, if the tree is entirely deprived of its core, fir or silver-fir or any other tree perishes.

All trees alike are destroyed when the roots are cut off, whether all or most of them, if those removed are the largest and the most essential to life. Such then are the causes of death which come from the removal of a part of the tree.

On the other hand the destruction which oil² causes is due rather to a kind of addition than to removal ; for oil is hostile to all trees, and³ so men pour it⁴ over what remains of the roots. However oil is more potent with young trees which are just growing ; for then they are weaker ; wherefore men do not allow them to be touched at that time.

⁵ Again trees may destroy one another, by robbing them of nourishment and hindering them in other ways. Again an overgrowth of ivy⁶ is dangerous,⁷ and so is tree-medick, for this destroys almost any-

⁴ i.e. to complete the destruction of a tree. cf. Plut. *Quaest. Conv.* 2. 6. 2.

⁵ Plin. 17. 239 and 240. ⁶ cf. C.P. 5. 15. 4.

⁷ χαλεπὸς δὲ καὶ Ald.; χαλεπὸς δ' ἐστὶν conj. W.

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ισχυρότερον δὲ τούτου τὸ ἄλιμον ἀπόλλυσι γὰρ τὸν κύτισον.

6 Ἔνια δὲ οὐ φθείρει μὲν χείρω δὲ ποιεῖ ταῖς δυνάμεσι τῶν χυλῶν καὶ τῶν ὀσμῶν, οἷον ἡ ράφανος καὶ ἡ δάφνη τὴν ἄμπελον. ὀσφραίνεσθαι γάρ φασι καὶ ἔλκειν. δι’ ὃ καὶ ὅταν ὁ βλαστὸς πλησίον γένηται πάλιν ἀναστρέφειν καὶ ἀφορᾶν ὡς πολεμίας οὕσης τῆς ὀσμῆς. Ἀνδροκύδης δὲ καὶ παραδείγματι τούτῳ κατεχρήσατο πρὸς τὴν βοήθειαν τὴν ἀπὸ τῆς ράφανου γινομένην πρὸς τὸν οἶνον, ὡς ἔξελαύνουσαν τὴν μέθην· φεύγειν γὰρ δὴ καὶ ζῶσαν τὴν ἄμπελον τὴν ὀσμήν. αἱ μὲν οὖν φθοραὶ πῶς τε γίνονται καὶ πόσαι καὶ ποσαχῶς φανερὸν ἐκ τῶν προειρημένων.

¹ ἔλκει: lit. 'draws it in'; cf. ἔλκειν ἀέρα, μέθυ, etc.

² cf. C.P. 2. 18. 4. ὁ βλαστὸς πλησίον conj. Dalec. from G; ὁ πλησίον βλαστός Ald. H.

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thing. But *halimon* is more potent even than this, for it destroys tree-medick.

Again some things, though they do not cause death, enfeeble the tree as to the production of flavours and scents; thus cabbage and sweet bay have this effect on the vine. For they say that the vine scents the cabbage and is infected¹ by it. Wherefore the vine-shoot,² whenever it comes near this plant, turns back and looks away,³ as though the smell were hostile to it. Indeed Androkydes⁴ used this fact as an example to demonstrate the use of cabbage against wine, to expel the fumes of drunkenness; for,⁵ said he, even when it is alive, the vine avoids the smell. It is now clear from what has been said how the death of a tree may be caused, how many are the causes of death, and in what several ways they operate.

¹ ἀφορᾶν conj. Sch.; εὐφορεῖν U; ἀφορεῖν Ald.; *averti* G; *recedere* Plin. *l.c.*; ἐκχωρεῖν conj. W.

² A medical man who preached temperance to Alexander; cf. Plin. 14. 58; 17. 240.

³ γὰρ δὴ καὶ conj. Dalec. from G; γὰρ δεῖ καὶ Ald.

BOOK V

E

Ι. Περὶ δὲ τῆς ὕλης, ποία τέ ἔστιν ἐκάστη, καὶ πόθ' ὡραία τέμνεσθαι, καὶ πρὸς ποῖα τῶν ἔργων χρησίμη, καὶ ποία δύσεργος ἢ εὔεργος, καὶ εἴ τι ἄλλο τῆς τοιαύτης ἴστορίας ἔχεται, πειρατέον ὁμοίως εἰπεῖν.

‘Ωραῖα δὴ τέμνεσθαι τῶν ξύλων τὰ μὲν οὖν στρογγύλα καὶ ὅσα πρὸς φλοϊσμὸν ὅταν βλαστάνητο τότε γὰρ εὐπεριαίρετος ὁ φλοιός, ὃ δὴ καλοῦσι λοπᾶν, διὰ τὴν ὑγρότητα τὴν ὑπογινομένην αὐτῷ. μετὰ δὲ ταῦτα δυσπεριαίρετος καὶ τὸ ξύλον μέλαν γίνεται καὶ δυσειδές. τὰ δὲ τετράγωνα μετὰ τὸν λοπητόν ἀφαιρεῖται γὰρ ἡ πελέκησις τὴν δυσείδειαν. ὅλως πᾶν πρὸς ἴσχὺν ὡραιότατον οὐ μόνον πεπαυμένον τῆς βλαστήσεως ἀλλ’ ἔτι μᾶλλον ἐκπεπᾶναν τὸν καρπόν. ἀλλὰ διὰ τὸν φλοϊσμὸν ἀώροις οὖσιν ὡραίοις συμβαίνει γίνεσθαι τοῖς στρογγύλοις, ὥστε ἐναντίαι αἱ ὡραι κατὰ συμβεβηκός. εὐ-

¹ Plin. 16. 188.

² cf. 3. 5. 1.

³ δυσπεριαίρετός conj. Sch.; δυσπερικάθαρτος Ald.

BOOK V

OF THE TIMBER OF VARIOUS TREES AND ITS USES.

I. In like manner we must endeavour to speak of timber, saying of what nature is that of each tree, what is the right season for cutting it, which kinds are hard or easy to work, and anything else that belongs to such an enquiry.

Of the seasons of cutting.

¹ Now these are the right seasons for cutting timber:—for ‘round’ timber and that whose bark is to be stripped the time is when the tree is coming into leaf. For then the bark is easily stripped (which process they call ‘peeling’²) because of the moisture which forms beneath it. At a later time it is hard to strip,³ and the timber obtained is black and uncomely. However square logs can be cut after the time of peeling, since trimming with the axe removes the uncomeliness. In general any wood is at the best season as to strength when it has not merely ceased coming into leaf, but has even ripened its fruit; however on account of the bark-stripping it comes to pass that ‘round’ timber is in season⁴ when it is cut before it is ripe, so that, as it happens, the seasons are here reversed. Moreover the wood

⁴ i.e. in practice the timber is cut before the ideally proper time.

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χρούστερα δὲ τὰ ἐλάτινα γίνεται κατὰ τὸν πρώτον λοπητόν.

2 Ἐπεὶ δὲ μάλιστ' ἡ μόνον περιαιροῦσι τὸν φλοιὸν ἐλάτης πεύκης πίτυος, ταῦτα μὲν τέμνεται τοῦ ἥρος· τότε γὰρ ἡ βλάστησις· τὰ δὲ ἄλλα ὅτε μὲν μετὰ πυροτομίαν, ὅτε δὲ μετὰ τρυγητὸν καὶ Ἀρκτούρον, οἷον ἀρία πτελέα σφένδαμνος μελία ζυγία ὁξύα φίλυρα φηγός τε καὶ ὅλως ὅσα κατορύττεται· δρῦς δὲ ὄψιαί τατα κατὰ χειμῶνα μετὰ τὸ μετόπωρον· ἐάν δὲ ὑπὸ τὸν λοπητὸν τμηθῆ, σήπεται τάχιστα ὡς εἰπεῖν, ἐάν τε ἔμφλοιος ἐάν τε ἄφλοιος· καὶ μάλιστα μὲν τὰ ἐν τῷ πρώτῳ λοπητῷ, δεύτερα δὲ τὰ ἐν τῷ δευτέρῳ, τρίτα δὲ καὶ ἥκιστα τὰ ἐν τῷ τρίτῳ· τὰ δὲ μετὰ τὴν πέπανσιν τῶν καρπῶν ἄβρωτα διαμένει, καὶ ἀλόπιστα ἡ· πλὴν ὑπὸ τὸν φλοιὸν ὑποδυόμενοι σκώληκες ἐπιπολῆς ἐγγράφουσι τὸ στέλεχος, οἷς καὶ σφραγίσι χρῶνται τινες· ὡραῖον δὲ τμηθὲν τὸ δρῦινον ἀσαπές τε καὶ ἀθριπηδέστατον γίνεται καὶ σκληρὸν καὶ πυκνὸν ὥσπερ κέρας· πᾶν γὰρ ὅμοιόν ἔστιν ἐγκαρδίῳ· πλὴν τό γε τῆς ἀλιφλοίου καὶ τότε φαῦλον.

3 Συμβαίνει δὲ καὶ τοῦτο ὑπεναντίον, ὅταν τε κατὰ τὴν βλάστησιν τέμνωνται καὶ ὅταν μετὰ τοὺς καρπούς. τότε μὲν γὰρ ἀναξηράίνεται τὰ στελέχη καὶ οὐ βλαστάνει τὰ δένδρα· μετὰ δὲ τοὺς καρποὺς παραβλαστάνει. δυστομώτερα δὲ

¹ cf. 3. 5. 1. ² ἡ add. Sch.

³ φηγός τε conj. Scal.; πηγός τε U; φηγόσιν τε V; πηγόσιν τε MAld.

⁴ κατορύττεται conj. Sch. from G; ὀρύττεται Ald. cf. 5. 4. 3; 5. 7. 5. ⁵ Plin. 16. 189.

ENQUIRY INTO PLANTS, V. I. 1-3

of the silver-fir is of a better colour at the time¹ of the first peeling.

But since they strip the bark of² hardly any trees except silver-fir fir and pine, these trees are cut in the spring; for then is the time of coming into leaf. Other trees are cut sometimes after wheat-harvest, sometimes after the vintage and the rising of Arcturus, as *aria* (holm-oak) elm maple manna-ash *zygia* beech lime Valonia oak,³ and in general all those whose timber is for underground use.⁴ The oak is cut latest of all, in early winter at the end of autumn.⁵ If it is cut at the time of peeling, it rots almost more quickly than at any other time, whether it has the bark on or not. This is especially so if it is cut during the first peeling, less so during the second, and least during the third. What is cut after the ripening of the fruit remains untouched by worms, even if it has not peeled: however worms get in under the bark and mark the surface of the stem, and such marked pieces of wood some use as seals.⁶ Oak-wood if cut in the right season does not rot and is remarkably free from worms, and its texture is hard and close like horn; for it is like the heart of a tree throughout, except that that of the kind called sea-bark oak is even at that time of poor quality.⁷

Again, if the trees are cut at the time of coming into leaf, the result is the opposite of that which follows when they are cut after fruiting: for in the former case the trunks dry up and the trees do not sprout into leaf,⁸ whereas after the time of fruiting they sprout at the sides. At this season however

⁶ *cf.* Ar. *Thesm.* 427: θριπήδεστα σφραγίδια.

⁷ *cf.* 3. 8. 5.

⁸ βλαστάνει M; παραβλαστάνει W. with Ald.

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διὰ τὴν σκληρότητα κατὰ ταύτην τὴν ὥραν.
κελεύουσι δὲ καὶ δεδυκυίας τῆς σελήνης τέμνειν
ώς σκληροτέρων καὶ ἀσαπεστέρων γινομένων.
ἐπεὶ δὲ αἱ πέψεις τῶν καρπῶν παραλλάττουσι,
δῆλον ὅτι καὶ αἱ ἀκμαὶ πρὸς τὴν τομὴν παραλ-
λάττουσιν· ἀεὶ γὰρ ὁψιαίτεραι αἱ τῶν ὁψικαρ-
ποτέρων. δι’ ὃ καὶ πειρῶνται τινες ὁρίζειν καθ’
ἐκάστην οἰον πεύκην μὲν καὶ ἐλάτην ὅταν ὑπο-
λοπῶσιν· ἔτι δὲ ὁξύαν καὶ φίλυραν καὶ σφέν-
δαμνον καὶ ζυγίαν τῆς ὀπώρας· δρῦν δέ, ὥσπερ
εἱρηται, μετὰ τὸ φθινόπωρον. φασὶ δέ τινες
πεύκην ὡραίαν είναι τοῦ ἥρος, ὅταν γε ἔχῃ τὴν
καλουμένην κάχρυν, καὶ τὴν πίτυν ὅταν ὁ βότρυς
αὐτῆς ἀνθῆ. ποῦα μὲν οὖν ὡραῖα καθ’ ἔκαστον
χρόνον οὕτω διαιροῦνται. πάντων δὲ δῆλον ὅτι
βελτίω τὰ τῶν ἀκμαζόντων δένδρων ἡ τῶν νέων
κομιδὴ καὶ γεγηρακότων· τὰ μὲν γὰρ ὑδατώδη, τὰ
δὲ γεώδη.

5 Πλείστας δὲ χρείας καὶ μεγίστας ἡ ἐλάτη καὶ
ἡ πεύκη παρέχονται, καὶ ταῦτα κάλλιστα καὶ
μέγιστα τῶν ξύλων ἔστι. διαφέρουσι δὲ ἀλλήλων
ἐν πολλοῖς· ἡ μὲν γὰρ πεύκη σαρκωδεστέρα τε
καὶ ὀλιγόηνος· ἡ δ’ ἐλάτη καὶ πολύηνος καὶ
ἄσαρκος, ὥστε ἐναντίως ἔκατερον ἔχειν τῶν
μερῶν, τὰς μὲν ἵνας ἴσχυρὰς τὴν δὲ σάρκα

¹ αἱ add. Sch.

² ὑπολοπῶσιν conj. Sch.; εἰ πέλειν εἰσὶ Ζ; ὑπελεινεισιν ΜΥ;

ὑπελινῶσιν Ald.

³ ταύτην conj. St.; καὶ τὴν Ald. H.

they are harder to cut because the wood is tougher. It is also recommended to do the cutting when the moon has set, since then the wood is harder and less likely to rot. But, since the times when the fruit ripens are different for different trees, it is clear that the right moment for cutting also differs, being later for those¹ trees which fruit later. Wherefore some try to define the time for the cutting of each tree; for instance for fir and silver-fir the time is, they say, when they begin to peel²: for beech lime maple and *zygia* in autumn; for oak,³ as has been said, when autumn is past. Some however say that the fir is ripe for cutting in spring, when it has on it the thing called 'catkin,'⁴ and the pine when its 'cluster'⁵ is in bloom. Thus they distinguish which trees are ripe for cutting at various times; however it is clear that in all cases the wood is better when the tree is in its prime than when it is quite young or has grown old, the wood of quite young trees being too succulent, and that of old ones too full of mineral matter.

Of the wood of silver-fir and fir.

Silver-fir and fir are the most useful trees and in the greatest variety of ways, and their⁶ timber is the fairest and largest. Yet they differ from one another in many respects; the fir is fleshier and has few fibres, while the silver-fir has many fibres and is not fleshy, so that in respect of each component it is the reverse of the other, having stout fibres⁷ but soft

¹ cf. 1. 1. 2 n.; 3. 5. 5.

² i.e. the male inflorescence.

³ *ταῦτα* conj. Sch. from G; *αὐτὰ* Ald. H.

⁷ cf. 3. 9. 7; Plin. 16. 184.

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μαλακήν καὶ μανήν. δι' ὁ τὸ μὲν βάρυ τὸ δὲ
 κοῦφον· τὸ μὲν γὰρ ἔνδαδον τὸ δὲ ἄδαδον, ἢ καὶ
 6 λευκότερον. ἔχει δὲ καὶ ὅζους πλείους μὲν ἡ
 πεύκη, σκληροτέρους δὲ ἡ ἐλάτη πολλῷ, μᾶλλον
 δὲ καὶ σκληροτάτους πάντων· ἄμφω δὲ πυκνοὺς
 καὶ κερατώδεις καὶ τῷ χρώματι ξανθοὺς καὶ
 δαδώδεις. ὅταν δὲ τμηθῶσι, ρεῖ καὶ ἐκ τῶν τῆς
 ἐλάτης καὶ ἐκ τῶν τῆς πεύκης ἐπὶ πολὺν χρόνον
 ὑγρότης καὶ μᾶλλον ἐκ τῶν τῆς ἐλάτης. ἔστι δὲ
 καὶ πολύλοπον ἡ ἐλάτη, καθάπερ καὶ τὸ κρόμυον·
 ἀεὶ γὰρ ἔχει τινὰ ὑποκάτω τοῦ φαινομένου, καὶ
 7 ἐκ τοιούτων ἡ ὅλη. δι' ὁ καὶ τὰς κώπας ξύοντες
 ἀφαιρεῖν πειρῶνται καθ' ἔνα καὶ ὄμαλῶς. ἐὰν γὰρ
 οὕτως ἀφαιρώσιν, ἵσχυρὸς ὁ κωπεών, ἐὰν δὲ
 παραλλάξωσι καὶ μὴ κατασπῶσιν ὄμοίως, ἀσθε-
 νής· πληγὴ γὰρ οὕτως, ἐκείνως δὲ ἀφαίρεσις. ἔστι
 δὲ καὶ μακρότατον ἡ ἐλάτη καὶ ὀρθοφυέστατον.
 δι' ὁ καὶ τὰς κεραίας καὶ τοὺς ιστοὺς ἐκ ταύτης
 ποιοῦσιν. ἔχει δὲ καὶ τὰς φλέβας καὶ τὰς ἴνας
 8 ἐμφανεστάτας πάντων. αὐξάνεται δὲ πρῶτον
 εἰς μῆκος, ἄχρι οὐδὲ δὴ ἐφίκηται τοῦ ἡλίου· καὶ
 οὔτε ὅζος οὐδεὶς οὔτε παραβλάστησις οὔτε πάχος
 γίνεται· μετὰ δὲ ταῦτα εἰς βάθος καὶ πάχος·
 οὕτως αἱ τῶν ὅζων ἐκφύσεις καὶ παραβλαστήσεις.

¹ τὸ μὲν γὰρ ἔνδ. conj. St. from G; ἔνδ. γὰρ Ald.

² cf. 3. 9. 7.

³ cf. 3. 9. 7, μόνον οὐ διαφανεῖς, whence it appears that the epithet refers to colour.

⁴ Plin. 16. 195. ⁵ i.e. the annual rings. cf. 1. 5. 2; 5. 5. 3.

⁶ cf. Hom. Od. 12. 172.

⁷ κατασπῶσιν conj. W.; κατὰ πᾶσιν UMV; κατὰ πάντα Ald.

⁸ cf. Plin. l.c. ⁹ cf. 1. 2. 1.

¹⁰ ἐμφανεστάτας conj. W.; εὐγενεστάτας Ald.

¹¹ δὲ conj. Sch.; καὶ UAld. H.

ENQUIRY INTO PLANTS, V. I. 5-8

flesh of open texture. Wherefore the timber of the one is heavy, of the other light, the one¹ being resinous, the other without resin; wherefore also it is whiter. Moreover the fir has more branches, but those of the silver-fir are much tougher, or rather they are tougher than those of any other tree; ² the branches of both however are of close texture, horny,³ and in colour brown and like resin-glutted wood. ⁴ When the branches of either tree are cut, sap streams from them for a considerable time, but especially from those of the silver-fir. Moreover the wood of the silver-fir has many layers, like an onion: ⁵ there is always another beneath that which is visible, and the wood is composed of such layers throughout. Wherefore, when men are shaving this wood to make oars,⁶ they endeavour to take off the several coats one by one evenly: for, if they do this, they get a strong spar, while if they do the work irregularly and do not strip⁷ off the coats evenly, they get a weak one; for the process in this case is hacking instead of stripping. The silver-fir also gives timber of the greatest lengths and of the straightest growth; wherefore yard-arms⁸ and masts are made from it. Also the vessels⁹ and fibre are more clearly¹⁰ seen in it than in any other tree. At first¹¹ it grows in height only, until it has reached¹² the sunshine; and so far there is no branch nor sidegrowth nor density of habit; but after that the tree proceeds to increase in bulk¹³ and density of habit, as¹⁴ the outgrowing branches and sidegrowths develop.

¹² ἀχρι . . . ἐφίκηται conj. Sch.; ἀχρι οὐδὲ κάφικηται U; ἀχρισ οὐκ ἀφίκηται MV; ἀχρισ οὐδὲ ἀχίκηται Ald. H.

¹³ cf. 4. 1. 4.

¹⁴ Lit. 'this being the effect of the outgrowth.' πάχος οὗτος Ald.; πάχος, δταν conj. W.

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9 Ταῦτα μὲν οὖν ἴδια τῆς ἐλάτης, τὰ δὲ κοινὰ καὶ πεύκης καὶ ἐλάτης καὶ τῶν ἄλλων. ἔστι γάρ ἡ μὲν τετράξος ἡ δὲ δίξος. καλοῦσι δὲ τετραξόους μὲν ὅσαις ἐφ' ἐκάτερα τῆς ἐντεριώνης δύο κτηδόνες εἰσὶν ἐναντίαν ἔχουσαι τὴν φύσιν. ἐπειτα καθ' ἐκάτεραν τὴν κτηδόνα ποιοῦνται τὴν πελέκησιν ἐναντίας τὰς πληγὰς κατὰ κτηδόνα φέροντες, ὅταν ἐφ' ἐκάτερα τῆς ἐντεριώνης ἡ πελέκησις ἀναστρέφῃ. τοῦτο γάρ ἐξ ἀνάγκης συμβαίνει διὰ τὴν φύσιν τῶν κτηδόνων. τὰς δὲ τοιαύτας ἐλάτας καὶ πεύκας τετραξόους καλοῦσι. εἰσὶ δὲ καὶ πρὸς τὰς ἐργασίας αὗται κάλλισται· πυκνότατα γάρ ἔχουσι τὰ ξύλα καὶ τὰς αἰγίδας αὗται 10 φύουσιν. αἱ δίξοι δὲ κτηδόνα μὲν ἔχουσι μίαν ἐφ' ἐκάτερα τῆς ἐντεριώνης, ταύτας δὲ ἐναντίας ἀλλήλαις, ὥστε καὶ τὴν πελέκησιν εἶναι διπλῆν, μίαν καθ' ἐκάτεραν κτηδόνα ταῖς πληγαῖς ἐναντίαις· ἀπαλώτατα μὲν οὖν ταῦτα φασιν ἔχειν τὰ ξύλα, χείριστα δὲ πρὸς τὰς ἐργασίας· διαστρέφεται γάρ μάλιστα. μονοξόους δὲ καλοῦσι τὰς ἔχουσας μίαν μόνον κτηδόνα· τὴν δὲ πελέκησιν αὐτῶν γίνεσθαι τὴν αὐτὴν ἐφ' ἐκάτερα τῆς ἐντεριώνης· φασὶ δὲ μανότατα μὲν ἔχειν τῇ φύσει τὰ ξύλα ταῦτα πρὸς δὲ τὰς διαστροφὰς ἀσφαλέστατα.

11 Διαφορὰς δὲ ἔχουσι τοῖς φλοιοῖς, καθ' ἃς γυνωρίζουσιν ἴδοντες εὐθὺς τὸ δένδρον πεφυκὸς

¹ Plin. *l.c.*

² The meaning of 'four-cleft' etc. seems to be this:



4-Cleft:



2-Cleft:



1-Cleft.

These are the characteristics peculiar to the silver-fir. Others it shares with the fir and the other trees of this class. ¹ For instance, sometimes a tree is 'four-cleft,' sometimes 'two-cleft'; it is called 'four-cleft' when on either side of the heart-wood there are two distinct and diverse lines of fissure: in that case the blows of the axe follow these lines in cases where the hewing is stopped short on either side of the heart-wood.² For the nature of the lines of fissure compels the hewing to take this course. Silver-firs or firs thus formed are said to be 'four-cleft.' And these are also the fairest trees for carpentry, their wood being the closest and possessing the *aegis*.³ Those which are 'two-cleft' have one single line of fissure on either side of the heart-wood, and the lines of fissure do not correspond to each other, so that the hewing also is performed by cuts which follow the two lines of fissure, so as to reach the two sides of the heart-wood at different angles. Now such wood, they say, is the softest, but the worst for carpentry, as it warps most easily. Those trees which have only a single⁴ continuous line of fissure are said to be 'one-cleft,' though here too the cutting is done from either side of the heart-wood: and such wood has, they say, an open⁵ texture, and yet⁶ it is not at all apt to warp.

⁷ There are also differences in the bark, by observation of which they can tell at once what the

³ cf. 3. 9. 3. ⁴ μίαν conj. W.; μίαν δὲ P₂Ald.

⁵ μανδρατα conj. W.; μανδρητα Ald.

⁶ τὰ ξύλα . . . τὰς conj. Sch.; τὰ ξύλα· ταῦτα δὲ πρὸς τὰς Ald. H. ⁷ Plin. 16. 195 and 196.

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ποῖόν τί ἔστι· τῶν μὲν γὰρ εὐκτηδόνων καὶ ἀστραβῶν καὶ ὁ φλοιὸς λεῖος καὶ ὄρθος, τῶν δὲ ἐναντίων τραχύς τε καὶ διεστραμμένος· ὁμοίως δὲ καὶ ἐπὶ τῶν λοιπῶν. ἀλλ' ἔστι τετράξια μὲν ὄλιγα μονόξια δὲ πλείω τῶν ἄλλων. ἀπαστα δὲ ἡ ὑλη μείζων καὶ ὄρθοτέρα καὶ ἀστραβεστέρα καὶ στιφροτέρα καὶ ὅλως καλλίων καὶ πλείων ἡ ἐν τοῖς προσβορείοις, ὥσπερ καὶ πρότερον ἐλέχθη· καὶ αὐτοῦ τοῦ δένδρου δὲ τὰ πρὸς βορρᾶν πυκνότερα καὶ νεανικώτερα. ὅσα δὲ ὑποπαράβορρα καὶ ἐν περίπυνῳ, ταῦτα στρέφει καὶ παραλλάττει παρὰ μικρὸν ὁ βορέας, ὥστε εἰναι παρεστραμμένην αὐτῶν τὴν μήτραν καὶ 12 οὐ κατ' ὄρθον. ἔστι δὲ ὅλα μὲν τὰ τοιαῦτα ἴσχυρὰ τμηθέντα δὲ ἀσθενῆ διὰ τὸ πολλὰς ἔχειν παραλλαγάς. καλοῦσι δὲ οἱ τέκτονες ἐπίτομα ταῦτα διὰ τὸ πρὸς τὴν χρείαν οὕτω τέμνειν. ὅλως δὲ χείρω τὰ ἐκ τῶν ἐφύγρων καὶ εὐδιεινῶν καὶ παλισκίων καὶ συνηρεφῶν καὶ πρὸς τὴν τεκτονικὴν χρείαν καὶ πρὸς τὴν πυρευτικήν. αἱ μὲν οὖν τοιαῦται διαφοραὶ πρὸς τοὺς τόπους εἰσὶν αὐτῶν τῶν ὁμογενῶν ὡς γε ἀπλῶς εἰπεῖν.

II. Διαιροῦσι γάρ τινες κατὰ τὰς χώρας, καὶ φασιν ἀρίστην μὲν εἰναι τῆς ὑλης πρὸς τὴν τεκτονικὴν χρείαν τῆς εἰς τὴν Ἑλλάδα παραγνομένης τὴν Μακεδονικήν· λεία τε γάρ ἔστι καὶ ἀστραβῆς καὶ ἔχουσα θυῖον. δευτέραν δὲ τὴν Ποντικήν, τρίτην δὲ τὴν ἀπὸ τοῦ Ῥινδάκου,

¹ πεφυκδεῖ: cf. Xen. Cyr. 4. 3. 5.

² ὑποπαράβορρα conj. St.; ὑπὸ παράβορρα Ald.; ὑπόβορρα ἡ παράβορρα conj. Sch.

timber of the tree is like as it stands.¹ For if the timber has straight and not crooked lines of fissure, the bark also is smooth and regular, while if the timber has the opposite character, the bark is rough and twisted; and so too is it with other points. However few trees are 'four-cleft,' and most of those which are not are 'one-cleft.' All wood, as was said before, which grows in a position facing north, is bigger, more erect, of straighter grain, tougher, and in general fairer and more abundant. Moreover of an individual tree the wood on the northward side is closer and more vigorous. But if a tree stands sideways to the north² with a draught round it, the north wind by degrees twists and contorts³ it, so that its core becomes twisted instead of running straight. The timber of such a tree while still in one piece is strong, but, when cut, it is weak, because the grain slants across the several pieces. Carpenters call such wood 'short lengths,' because they thus cut it up for use. Again in general wood which comes from a moist, sheltered, shady or confined position is inferior both for carpentry and for fuel. Such are the differences, generally⁴ speaking, between trees of the same kind as they are affected by situation.

Of the effects on timber of climate.

II. ⁵Some indeed make a distinction between regions and say that the best of the timber which comes into Hellas for the carpenter's purposes is the Macedonian, for it is smooth and of straight grain, and it contains resin: second best is that from Pontus, third that

³ παραλλάττει conj. Dalec.; παραλλάγει U; παραλήγει Ald.; παραλυγίζει conj. H. Steph.

⁴ γε conj. Sch.; δὲ Ald. ⁵ Plin. 16. 197.

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τετάρτην δὲ τὴν Αἰνιανικήν· χειρίστην δὲ τήν τε Παρνασιακήν καὶ τὴν Εύβοϊκήν· καὶ γὰρ ὀζώδεις καὶ τραχείας καὶ ταχὺ σήπεσθαι. περὶ δὲ τῆς Ἀρκαδικῆς σκεπτέον.

2 Ἰσχυρότατα δὲ τῶν ξύλων ἔστι τὰ ἀοξα καὶ λεια· καὶ τῇ ὄψει δὲ ταῦτα κάλλιστα. ὀζώδη δὲ γίνεται τὰ κακοτροφηθέντα καὶ ἥτοι χειμῶνι πιεσθέντα ἥ καὶ ἄλλω τινὶ τοιούτῳ· τὸ γὰρ ὅλου τὴν πολυοξίαν εἶναι ἔνδειαν εύτροφίας. ὅταν δὲ κακοτροφήσαντα ἀναλάβῃ πάλιν καὶ εύσθενήσῃ, συμβαίνει καταπίνεσθαι τοὺς ὅζους ὑπὸ τῆς περιφύσεως· εύτροφοῦν γὰρ καὶ αὐξανόμενον ἀναλαμβάνει καὶ πολλάκις ἔξωθεν μὲν λείον τὸ ξύλον διαιρούμενον δὲ ὀζώδες ἐφάνη. δι' ὁ καὶ σκοποῦνται τῶν σχιστῶν τὰς μήτρας· ἐὰν γὰρ αῦται ἔχωσιν ὅζους, ὀζώδη καὶ τὰ ἔκτος· καὶ οὗτοι χαλεπώτεροι τῶν ἔκτος καὶ φανεροί.

3 Γίνονται δὲ καὶ αἱ σπεῖραι διὰ χειμῶνας τε καὶ κακοτροφίαν. σπείρας δὲ καλοῦσιν ὅταν ἥ συστροφή τις ἐν αὐτῇ μείζων καὶ κύκλοις περιεχομένη πλείοσιν οὕθ' ὥσπερ ὁ ὅζος ἀπλῶς οὕθ' ὡς ἥ οὐλότης ἥ ἐν αὐτῷ τῷ ξύλῳ· δι' ὅλου γάρ πως αὕτη καὶ ὁμαλίζουσα· χαλεπώτερον δὲ τοῦτο πολὺ καὶ δυσεργότερον τῶν ὅζων. ἔοικε δὲ παραπλησίως καὶ ὡς ἐν τοῖς λίθοις ἐγγίνεσθαι

¹ A river which flows into the Propontis on the Asiatic side.

² Near Mount Oeta. Αἰνιανικήν conj. Palm. from Plin. l.c.; αἰανικήν P₂Ald.H.

³ ταῦτα κάλλιστα· ὀζώδη δὲ conj. Scal.; ταῦτα καὶ μάλιστα ὀζώδη γίν. Ald.H.; ταῦτα μάλιστα· ὀζώδη δὲ γίν. U.

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from the Rhydakos,¹ fourth that of the country of the Ainianes,² worst is that of Parnassus and that of Euboea, for it is full of knots and rough and quickly rots. As to Arcadian timber the case is doubtful.

Of knots and 'coiling' in timber.

The strongest wood is that which is without knots and smooth, and it is also the fairest in appearance.³ Wood becomes knotty when it has been ill nourished and has suffered severely whether from winter or some such cause ; for in general a knotty habit is supposed to indicate lack of nourishment. When however, after being ill nourished, the tree recovers and becomes vigorous, the result is that the knots are absorbed⁴ by the growth which now covers them ; for the tree, being now well fed and growing vigorously, recovers, and often the wood is smooth outside, though when split it is seen to have knots. And this is why they examine the core of wood that has been split ; for, if this contains knots, the outward⁵ parts will also be knotty, and these knots are harder to deal with than the outer ones, and are easily recognised.

⁶ 'Coiling' of the wood is also due to winter or ill nourishment. Wood is said to 'coil' when there is in it closer twisting⁷ than usual, made up of an unusual number of rings : this is not quite like a knot, nor is it like the ordinary curling of the wood, which runs right through it and is uniform. 'Coiling' is much more troublesome and difficult to deal with than knots ; it seems to correspond to the so-called

⁴ κατατίνεσθαι : ? καταλαμβάνεσθαι. cf. below, § 3.

⁵ i.e. outward in regard to the core. ⁶ Plin. 16. 198.

⁷ ἢ συστροφή conj. Scal. ; ἢ εὐστροφή U ; ἢ εὐτραφή Ald. etc.

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τετάρτην δὲ τὴν Αἰνιανικήν· χειρίστην δὲ τήν τε Παρνασιακήν καὶ τὴν Εὐβοϊκήν· καὶ γὰρ ὀξώδεις καὶ τραχείας καὶ ταχὺ σήπεσθαι. περὶ δὲ τῆς Ἀρκαδικῆς σκεπτέον.

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3 Γίνονται δὲ καὶ αἱ σπείραι διὰ χειμῶνας τε καὶ κακοτροφίαν. σπείρας δὲ καλοῦσιν ὅταν ἥ συστροφή τις ἐν αὐτῇ μείζων καὶ κύκλοις περιεχομένη πλείοσιν οὐθ' ὥσπερ ὁ ὅξος ἀπλῶς οὐθ' ὡς ἡ οὐλότης ἥ ἐν αὐτῷ τῷ ξύλῳ· δι' ὅλου γάρ πως αὕτη καὶ ὅμαλίζουσα· χαλεπώτερον δὲ τοῦτο πολὺ καὶ δυσεργότερον τῶν ὅξων. ἔοικε δὲ παραπλησίως καὶ ὡς ἐν τοῖς λίθοις ἐγγίνεσθαι

¹ A river which flows into the Propontis on the Asiatic side.

² Near Mount Oeta. Αἰνιανικήν conj. Palm. from Pli. l.c.; αἰανικήν P₂Ald.H.

³ ταῦτα κάλλιστα· ὀξώδη δὲ conj. Scal.; ταῦτα καὶ μὲν ὀξώδη γίν. Ald.H.; ταῦτα μάλιστα· ὀξώδη δὲ γίν. U.

ENQUIRY INTO PLANTS, V

ENQUIRY INTO PLANTS, V.

From the Rhynchos, fourth that of the
of the Ainianes,² worst is that of Parussoos &
of Euboea, for it is full of knots and rough
quickly rots. As to Arcadian timber the
doubtful.

The strongest wood is that which
and smooth, and it is also the lai
wood becomes knotty when the
it has suffered, for
such a
and
such a

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τὰ καλούμενα κέντρα. ὅτι δ' ἡ περίφυσις καταλαμβάνει τοὺς ὅζους φανερώτατον ἐξ αὐτῆς τῆς αἰσθήσεως, οὐ μὴν ἀλλὰ καὶ ἐκ τῶν ἄλλων ⁴ τῶν ὄμοίων πολλάκις γὰρ αὐτοῦ τοῦ δένδρου μέρος τι συνελήφθη ὑπὸ θατέρου συμφυοὺς γενομένου· καὶ ἐάν τις ἐκγλύφας θῆ λίθον εἰς τὸ δένδρον ἥ καὶ ἄλλο τι τοιοῦτον, κατακρύπτεται περιληφθὲν ὑπὸ τῆς περιφύσεως· ὅπερ καὶ περὶ τὸν κότινον συνέβη τὸν ἐν Μεγάροις τὸν ἐν τῇ ἀγορᾷ οὖν καὶ ἐκκοπέντος λόγιον ἥν ἀλῶναι καὶ διαρπασθῆναι τὴν πόλιν· ὅπερ ἐγένετο Δημήτριος. ἐν τούτῳ γὰρ διασχιζομένῳ κυνημίδεις εὑρέθησαν καὶ ἄλλ' ἄττα τῆς Ἀττικῆς ἐργασίας κρεμαστά, τοῦ κοτίνου οὖν ἀνετέθη τὸ πρῶτον ἐγκοιλανθέντος. τούτου δ' ἔτι μικρὸν τὸ λοιπόν. πολλαχοῦ δὲ καὶ ἄλλοθι γίνεται πλείονα τοιαῦτα. καὶ ταῦτα μέν, ὥσπερ εἴρηται, κοινὰ πλειόνων.

III. Κατὰ δὲ τὰς ἴδιας ἑκάστου φύσεις αἱ τοιαῦται εἰσὶ διαφοραὶ, οἷον πυκνότης μανότης βαρύτης κουφότης σκληρότης μαλακότης, ὡσαύτως δὲ καὶ εἴ τις ἄλλη τοιαύτη· κοιναὶ δὲ ὄμοίως αὗται καὶ τῶν ἡμέρων καὶ τῶν ἀγρίων, ὥστε περὶ πάντων λεκτέον.

¹ ὅτι δ' ἡ conj. W.; ὅτι δὴ UΜV; ὅτι δὲ Ald.

² cf. κατακίνεσθαι, above, § 2.

³ Plin. 16. 198 and 199.

⁴ ἐκγλύφας θῆ conj. W.; ἐκλύφας θῆι U; ἐκλιθασθῆ Ald. H.

⁵ Text defective.

⁶ i.e. the bark had grown over these. cf. Plin. l.c.

‘centres’ which occur in marbles. That¹ vigorous growth covers² up the knots is plain from simple observation of the fact and also from other similar instances. ³ For often some part of the tree itself is absorbed by the rest of the tree which has grown into it; and again, if one makes a hole in a tree and puts⁴ a stone into it or some other such thing, it becomes buried, being completely enveloped by the wood which grows all round it: this happened with the wild olive in the market-place at Megara; there was an oracle that, if this were cut open, the city would be taken and plundered, which came to pass when Demetrius took it.⁵ For, when this tree was split open, there were found greaves and certain other things⁶ of Attic workmanship hanging there, the hole⁷ in the tree having been made at the place where the things were originally hung on it as offerings. Of this tree a small part still exists, and in many other places further instances have occurred. Moreover, as has been said, such occurrences happen also with various other trees.

Of differences in the texture of different woods.

III. ⁸ Corresponding to the individual characters of the several trees we have the following kinds of differences in the wood:—it differs in closeness, heaviness, hardness or their opposites, and in other similar ways; and these differences are common to cultivated and wild trees. So that we may speak of all trees without distinction.

⁷ ἐργαστὰ τοῦ κοτίου οὗ I conj. from G and Plin. *l.c.* (certain restoration perhaps impossible); κερμηστὶ δὲ στιν ἐν κοτίῳ οὗ U; Ald. has κερμηστὶ, M κρεμαστὶ, V κερμαστῶν; St. suggested κρεμαστῶν διτλῶν as words of the original text. ⁸ Plin. 16. 204-207.

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Πυκνότατα μὲν οὖν δοκεῖ καὶ βαρύτατα πύξις εἰναι καὶ ἔβενος· οὐδὲ γὰρ οὐδ' ἐπὶ τοῦ ὕδατος ταῦτ' ἐπινεῖ. καὶ ἡ μὲν πύξις ὀλη, τῆς δὲ ἔβενου ἡ μήτρα, ἐν ἥ καὶ ἡ τοῦ χρώματός ἐστι μελανία. τῶν δὲ ἄλλων ὁ λωτός. πυκνὸν δὲ καὶ ἡ τῆς δρυὸς μήτρα, ἣν καλοῦσι μελάνδρυον· καὶ ἔτι μᾶλλον ἡ τοῦ κυτίσου· παρομοία γὰρ αὐτῇ δοκεῖ τῇ ἔβενῳ εἰναι.

2 Μέλαν δὲ σφόδρα καὶ πυκνὸν τὸ τῆς τερμίνθου· περὶ γοῦν Συρίαν μελάντερόν φασιν εἰναι τῆς ἔβενου· καὶ ἐκ τούτου γὰρ καὶ τὰς λαβᾶς τῶν ἐγχειριδίων ποιεῖσθαι, τορνεύεσθαι δὲ ἔξ αὐτῶν καὶ κύλικας Θηρικλείους, ὥστε μηδένα ἀν διαγνῶναι πρὸς τὰς κεραμέας· λαμβάνειν δὲ τὸ ἐγκάρδιον· δεῖν δὲ ἀλείφειν τὸ ξύλον· οὗτῳ γὰρ γίνεσθαι καὶ κάλλιον καὶ μελάντερον.

Εἶναι δὲ καὶ ἄλλο τι δένδρον, δὲ ἄμα τῇ μελανίᾳ καὶ ποικιλίᾳ τινὰ ἔχει ὑπέρυθρον, ὥστε εἰναι τὴν ὄψιν ὡσὰν ἔβενου ποικίλης· ποιεῖσθαι δὲ ἔξ αὐτοῦ καὶ κλίνας καὶ δίφρους καὶ τὰ ἄλλα τὰ σπουδαζόμενα. τὸ <δὲ> δένδρον μέγα σφόδρα καὶ καλόφυλλον εἶναι ὅμοιον ταῖς ἀπίοις.

3 Ταῦτα μὲν οὖν ἄμα τῇ μελανίᾳ καὶ πυκνότητα ἔχει. πυκνὸν δὲ καὶ ἡ σφένδαμνος καὶ ἡ ζυγία καὶ ὄλως πάντα τὰ οὐλα· καὶ ἡ ἐλάα δὲ καὶ ὁ κότινος, ἄλλα κραῦρα. μανὰ δὲ τῶν μὲν ἀγρίων καὶ ἐρεψίμων τὰ ἐλάτινα μάλιστα,

¹ cf. Arist. *Meteor.* 4. 7 ad fin.

² cf. 1. 6. 1. ³ cf. 3. 15. 3.

⁴ Probably so called from their resemblance in shape and

ENQUIRY INTO PLANTS, V. III. 1-3

Box and ebony seem to have the closest and heaviest wood; for their wood does not even float on water. This applies to the box-tree as a whole, and to the core of the ebony, which contains the black pigment.¹ The nettle-tree also is very close and heavy, and so is the core of the oak, which is called 'heart of oak,' and to a still greater degree this is true of the core of laburnum²; for this seems to resemble the ebony.

The wood of the terebinth is also very black and close-grained; at least in Syria³ they say that it is blacker than ebony, that in fact they use it for making their dagger handles; and by means of the lathe-chisel they also make of it 'Theriklean' cups,⁴ so that no one could⁵ distinguish these from cups made of pottery; for this purpose they use, it is said, the heart-wood, but the wood has to be oiled, for then it becomes comelier and blacker.

There is also, they say, another tree⁶ which, as well as the black colour, has a sort of reddish variegation, so that it looks like variegated ebony, and of it are made beds and couches and other things of superior quality. This tree is very large and has handsome leaves and is like the pear.

These trees then, as well as the black colour, have close wood; so also have maple *zygia* and in general all those that are of compact growth; so also have the olive and the wild olive, but their wood is brittle.⁷ Of wild trees which are used for roof-timbers the wood of the silver-fir is the least com- colour to the cups made by Therikles, a famous Corinthian potter; see reff. to comedy in LS. s.v.

⁵ μηδένα δν conj. W.; μηδ' δν ἔνα Ald.

⁶ Sissoo wood. See Index App. (21).

⁷ ἀλλὰ κραῦρα conj. Sch.; ἀλλὰ καὶ αῦρα MVAld.

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τῶν δ' ἄλλων τὰ ἄκτινα καὶ τὰ σύκινα καὶ τὰ τῆς μηλέας καὶ τὰ τῆς δάφνης. σκληρότατα δὲ τὰ δρύινα καὶ τὰ ξύγινα καὶ τὰ τῆς ἀρίας· καὶ γὰρ ὑποβρέχουσι ταῦτα πρὸς τὴν τρύπησιν μαλάξεως χάριν. μαλακὰ δὲ καθ' ὅλου μὲν τὰ μανὰ καὶ χαῦνα· τῶν δὲ σαρκωδῶν μάλιστα φίλυρα. δοκεῖ δὲ καὶ θερμότατον εἶναι τοῦτο· σημεῖον δὲ ὅτι μάλιστα ἀμβλύνει τὰ σιδήρια· τὴν γὰρ βαφὴν ἀνίησι διὰ τὴν θερμότητα.

4 Θερμὸν δὲ καὶ κιττὸς καὶ δάφνη καὶ ὄλως ἔξ ὧν τὰ πυρεῖα γίνεται. Μενέστωρ δέ φησι καὶ συκάμινον. ψυχρότατα δὲ τὰ ἔνυδρα καὶ ὄνδατώδη. καὶ γλίσχρα δὲ τὰ ἴτεῖνα καὶ ἀμπέλινα, δι' ὃ καὶ τὰς ἀσπίδας ἐκ τούτων ποιοῦσι· συμμύει γὰρ πληγέντα· κουφότερον δὲ τὸ τῆς ἴτεας, μανότερον γάρ, δι' ὃ καὶ τούτῳ μᾶλλον χρῶνται. τὸ δὲ τῆς πλατάνου γλισχρότητα μὲν ἔχει, φύσει δὲ ὑγρότερον τοῦτο καὶ τὸ τῆς πτελέας. σημεῖον δέ ἐστιν, μετὰ τὴν τομὴν ὅρθὸν ὅταν σταθῆ, πολὺ ὄνδωρ ἀφίησι. τὸ δὲ τῆς συκαμίνου πυκνὸν ἀμά καὶ γλίσχρον.

5 Ἔστι δὲ καὶ ἀστραβέστατον τὸ τῆς πτελέας, δι' ὃ καὶ τὸν στροφεῖς τῶν θυρῶν ποιοῦσι πτελεῖνος· ἐὰν γὰρ οὗτοι μένωσι, καὶ αἱ θύραι μένουσιν ἀστραβεῖς, εἰ δὲ μή, διαστρέφονται. ποιοῦσι δ' αὐτοὺς ἔμπαλιν τιθέντες τὰ ξύλα τότε ἀπὸ τῆς ρίζης καὶ τὸ ἀπὸ τοῦ φύλλου·

¹ ὑποβρέχουσι conj. Harduin from Plin. 16. 207; ἀποβρίθουσι Ald. H.; ἀποβρέχουσι mBas.

² cf. 5. 1, which, referring to this passage, hardly agrees with it as now read.

ENQUIRY INTO PLANTS, V. III. 3-5

pact, and among others that of the elder fig apple and bay. The hardest woods are those of the oak *zygia* and *aria* (holm-oak); in fact men wet¹ these to soften them for boring holes. In general, woods which are of open porous texture are soft, and of those of fleshy texture the softest is the lime. The last-named seems also to be the hottest; the proof of which is that it blunts iron tools more than any other; for they lose their edge² by reason of its heat.

Ivy and bay are also hot woods, and so in general are those used for making fire-sticks; and Menestor³ adds the wood of the mulberry.⁴ The coldest woods are those which grow in water and are of succulent character. The wood again of willow and vine is tough; wherefore men make their shields of these woods; for they close up again after a blow; but that of the willow is lighter, since it is of less compact texture; wherefore they use this for choice. The wood of the plane is fairly tough, but it is moister in character, as also is that of the elm. A proof of this is that, if it is set upright⁵ after being cut, it discharges much water.⁶ The wood of the mulberry is at once of close grain and tough.

The wood of the elm is the least likely to warp; wherefore they make the 'hinges'⁸ of doors out of elm wood; for, if these hold, the doors also keep in place; otherwise they get wrenched out of place. They make the 'hinges' by putting wood from the root above⁹ and wood 'from the foliage' below,⁹ thus

³ cf. 1. 2. 3 n.

⁴ Plin. 16. 209.

⁵ ὄρθδν ὅταν conj. W.: so G; ὄρθδς ὅταν MV; ὅταν ὄρθδ Ald.

⁶ cf. 5. 1. 6. ⁷ Plin. 16. 210.

⁸ Sc. an arrangement of cylindrical pivot and socket.

⁹ i.e. as socket and pivot respectively; cf. 5. 5. 4.

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καλοῦσι δὲ οἱ τέκτονες τὸ ἀπὸ τοῦ φύλλου τὸ
ἄνω· ἐναρμοσθέντα γὰρ ἀλλήλοις ἐκάτερον κω-
λύει πρὸς τὴν ὄρμὴν ἐναντίως ἔχον. εἰ δὲ ἔκειτο
κατὰ φύσιν, οὐπερ ἡ ροπὴ ἐνταῦθα πάντων ἀν-
ήν ἡ φορά.

Τὰς δὲ θύρας οὐκ εὐθὺς συντελοῦσιν, ἀλλὰ
πήξαντες ἐφιστᾶσι, καπεῖτα ὑστέρῳ οἱ δὲ τῷ
τρίτῳ ἔτει συνετέλεσαν ἐὰν μᾶλλον σπουδάζωσι·
τοῦ μὲν γὰρ θέρους ἀναξηραινομένων διεστανταί,
τοῦ δὲ χειμῶνος συμμύουσιν. αἴτιον δ' ὅτι τῆς
ἐλάτης τὰ μανὰ καὶ σαρκώδη ἔλκει τὸν ἀέρα
ἔνικμον ὄντα.

6 'Ο δὲ φοῖνιξ κοῦφος καὶ εὐεργος καὶ μαλακός,
ώσπερ ὁ φελλός, βελτίων δὲ τοῦ φελλοῦ ὅτι γλί-
σχρος· ἔκεινο δὲ θραυστόν. διὰ τοῦτο τὰ εἰδωλα
νῦν ἔκ τοῦ τῶν φοινίκων ποιοῦσι, τὸν δὲ φελλὸν
παρήκασι. τὰς ἵνας δὲ οὐ δι' ὅλου ἔχει οὐδὲ ἐπὶ¹
πολὺ καὶ μακρὰς οὐδὲ ὡσαύτως τῇ θέσει ἐγκει-
μένας πάσας ἀλλὰ παντοδαπῶς. ἀναξηραίνεται
δὲ καὶ λεαινόμενον καὶ πριόμενον τὸ ξύλον.

7 Τὸ δὲ θύον, οἱ δὲ θύαν καλοῦσι, παρ' "Αμμωνί²
τε γίνεται καὶ ἐν τῇ Κυρηναίᾳ, τὴν μὲν μορφὴν
ὅμοιον κυπαρίτῳ καὶ τοῖς κλάδοις καὶ τοῖς φύλ-
λοις καὶ τῷ στελέχει καὶ τῷ καρπῷ, μᾶλλον δ'
ώσπερ κυπάριττος ἀγρία· πολὺ μὲν καὶ ὅπου

¹ κωλύει: Sch. adds θάτερον from G.

² ἔκειτο conj. W.; ἔκεινο Ald.

³ i.e. the 'upper' wood in the upper position.

⁴ πάντων MSS. (?) ; πάντως conj. W.

⁵ i.e. there would be no resistance. ἦν after ἀν add. Sch.

ENQUIRY INTO PLANTS, V. III. 5-7

reversing the natural position : (by wood 'from the foliage' joiners mean the upper wood). For, when these are fitted the one into the other, each counter-acts¹ the other, as they naturally tend in opposite directions : whereas, if the wood were set² as it grows,³ all the parts⁴ would give where the strain came.⁵

(They do not finish off the doors at once ; but, when they have put them together, stand them up, and then finish them off the next year, or sometimes the next year but one,⁶ if they are doing specially good work. For in summer, as the wood dries, the work comes apart, but it closes in winter. The reason is that the open fleshy texture of the wood of the silver-fir⁷ drinks in the air, which is full of moisture.)

⁸ Palm-wood is light easily worked and soft like cork-oak, but is superior to that wood, as it is tough, while the other is brittle. Wherefore men now make their images of palm-wood and have given up the wood of cork-oak. However the fibres do not run throughout the wood, nor do they run to a good length, nor are they all set symmetrically, but run in every direction. The wood dries while it is being planed and sawn.

⁹ *Thyon* (thyine wood), which some call *thya*, grows near the temple of Zeus Ammon and in the district of Cyrene. In appearance the tree is like the cypress alike in its branches, its leaves, its stem, and its fruit ; or rather it is like a wild cypress.¹⁰ There

⁶ cf. Plin. 16. 215.

⁷ Of which the door itself is made.

⁸ Plin. 16. 211. ⁹ Plin. 13. 100-102.

¹⁰ κυπάριστος ἄγρια conj. Sch.; κυπάρισσον ἄγριαν MAld.

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νῦν ἡ πόλις ἔστι, καὶ ἔτι διαμνημονεύουσιν ὄροφάς τινας τῶν ἀρχαίων οὕσας. ἀσαπὲς γὰρ ὅλως τὸ ξύλον οὐλότατον δὲ τὴν ρίζαν ἔστι· καὶ ἐκ ταύτης τὰ σπουδαιότατα ποιεῖται τῶν ἔργων. τὰ δὲ ἀγάλματα γλύφουσιν ἐκ τῶνδε, κέδρων κυπαρίττου λωτοῦ πύξου· τὰ δὲ ἐλάττω καὶ ἐκ τῶν ἐλαίνων ρίζῶν ἀρραγεῖς γὰρ αὗται καὶ ὁμαλῶς πως σαρκώδεις. ταῦτα μὲν οὖν ἴδιότητά τινα τόπων καὶ φύσεως καὶ χρείας ἀποδηλοῦ.

IV. Βαρέα δὲ καὶ κοῦφα δῆλον ὡς τῇ πυκνότητι καὶ μανότητι καὶ ὑγρότητι καὶ ξηρότητι καὶ τῷ γλοιώδει καὶ σκληρότητι καὶ μαλακότητι ληπτέον. ἔνια μὲν οὖν ἄμα σκληρὰ καὶ βαρέα, καθάπερ πύξος καὶ δρῦς· ὅσα δὲ κραῦρα καὶ τῇ ξηρότητι σκληρότατα, ταῦτ' οὐκ ἔχει βάρος. ἀπαντα δὲ τὰ ἄγρια τῶν ἡμέρων καὶ τὰ ἄρρενα τῶν θηλειῶν πυκνότερά τε καὶ σκληρότερα καὶ βαρύτερα καὶ τὸ ὅλον ἴσχυρότερα, καθάπερ καὶ πρότερον εἴπομεν. ὡς δὲ ἐπὶ τὸ πᾶν καὶ τὰ ἀκαρπότερα τῶν καρπίμων καὶ τὰ χείρω τῶν καλλικαρποτέρων· εἰ μή που καρπιμώτερον τὸ ἄρρεν, ὡσπερ ἄλλα τέ φασι καὶ τὴν κυπάριττουν καὶ τὴν κράνειαν. ἀλλὰ τῶν γε ἀμπέλων φανερῶς αἱ ὄλιγοκαρπότεραι καὶ πυκνοφθαλμότεραι καὶ στερεώτεραι· καὶ μηλεῶν δὲ καὶ τῶν ἄλλων ἡμέρων.

is abundance of it where now the city stands, and men can still recall that some of the roofs in ancient times were made of it. For the wood is absolutely proof against decay, and the root is of very compact texture, and they make of it the most valuable articles. Images are carved from these woods, prickly cedar cypress nettle-tree box, and the small ones also from the roots of the olive, which are unbreakable and of a more or less uniformly fleshy character. The above facts illustrate certain special features of position, natural character and use.

Of differences in timber as to hardness and heaviness.

IV. Difference in weight is clearly to be determined by closeness or openness of texture, dampness or dryness, degree of glutinousness, hardness or softness. Now some woods are both hard and heavy, as box and oak, while those that are brittle and hardest owing to their dryness, are not heavy.¹ All wood of wild trees, as we have said before, is closer harder heavier, and in general stronger than that of the cultivated forms, and there is the same difference between the wood of 'male' and of 'female' trees, and in general between trees which bear no fruit and those which have fruit, and between those which bear inferior fruit and those whose fruit is better; on the other hand occasionally the 'male' tree is the more fruitful, for instance, it is said, the cypress the cornelian cherry and others. However of vines it is clear that those which bear less fruit have also more frequent knots and are more solid,² and so too with apples and other cultivated trees.

¹ Plin. 16. 211.

² cf. C.P. 3. 11. 1.

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2 Ἀσαπῆ δὲ φύσει κυπάριττος κέδρος ἔβενος λωτὸς πύξος ἐλάα κότινος πεύκη ἔνδαδος ἀρία δρῦς καρύα Εὐβοϊκή. τούτων δὲ χρονιώτατα δοκεῖ τὰ κυπαρίττινα εἶναι· τὰ γοῦν ἐν Ἐφέσῳ, ἐξ ὧν αἱ θύραι τοῦ νεωστὶ νεώ, τεθησαυρισμένα τέτταρας ἔκειτο γενεάς. μόνα δὲ καὶ στιλβηδόνα δέχεται, δι' ὃ καὶ τὰ σπουδαζόμενα τῶν ἔργων ἐκ τούτων ποιοῦσι. τῶν δὲ ἄλλων ἀσαπέστατον μετὰ τὰ κυπαρίττινα καὶ τὰ θυώδη τὴν συκάμινον εἶναι φασι, καὶ ἵσχυρὸν ἄμα καὶ εὔεργον τὸ ξύλον· γίνεται δὲ τὸ ξύλον [καὶ] παλαιούμενον μέλαν, ὕσπερ λωτός.

3 "Ετι δὲ ἄλλο πρὸς ἄλλο καὶ ἐν ἄλλῳ ἀσαπέσ, οἷον πτελέα μὲν ἐν τῷ ἀέρι, δρῦς δὲ κατορυττομένη καὶ ἐν τῷ ὕδατι καταβρεχομένη· δοκεῖ γὰρ δλως ἀσαπὲς εἶναι· δι' ὃ καὶ εἰς τοὺς ποταμοὺς καὶ εἰς τὰς λίμνας ἐκ τούτων ναυπηγοῦσιν· ἐν δὲ τῇ θαλάττῃ σήπεται. τὰ δὲ ἄλλα διαμένει μᾶλλον, ὅπερ καὶ εὔλογον, ταριχευόμενα τῇ ἄλμῃ.

4 Δοκεῖ δὲ καὶ ἡ ὁξύη πρὸς τὸ ὕδωρ ἀσαπῆς εἶναι καὶ βελτίων γίνεσθαι βρεχομένη. καὶ ἡ καρύα δὲ ἡ Εὐβοϊκὴ ἀσαπῆς. φασὶ δὲ καὶ τὴν πεύκην ἐλάτης μᾶλλον ὑπὸ τερηδόνος ἐσθίεσθαι· τὴν μὲν γὰρ εἶναι ξηράν, τὴν δὲ πεύκην ἔχειν γλυκύτητα, καὶ ὅσῳ ἐνδαδωτέρα, μᾶλλον· πάντα

¹ Plin. 16. 213.

² τεθησαυρισμένα . . . ἔκειτο conj. Bentley; τεθησαυρισμέναι . . . ἔκειντο Ald. H.; P has ἔκειτο.

ENQUIRY INTO PLANTS, V. IV. 2-4

Of differences in the keeping quality of timber.

¹ Naturally proof against decay are cypress prickly cedar ebony nettle-tree box olive wild olive resinous fir *aria* (holm-oak) oak sweet chestnut. Of these the wood of the cypress seems to last longest; at least the cypress-wood at Ephesus, of which the doors of the modern temple were made, lay stored up² for four generations. And this is the only wood which takes a fine polish, wherefore they make of it valuable articles. Of the others the least liable to decay after the wood of the cypress and thyine-wood is, they say, that of the mulberry, which is also strong and easily worked: when it becomes old, this wood turns black like that of the nettle-tree.

³ Again whether a given wood is not liable to decay may depend on the purpose to which it is put and the conditions to which it is subjected: thus the elm does not decay if exposed to the air, nor the oak if it is buried or soaked in water; for it appears to be entirely proof against decay: wherefore they build vessels of it for use on rivers and on lakes, but in sea-water it rots, though other woods last all the better; which is natural, as they become seasoned with the brine.

⁴ The beech also seems to be proof against decay in water and to be improved by being soaked. The sweet chestnut under like treatment is also proof against decay. They say that the wood of the fir is more liable to be eaten by the *teredon* than that of the silver-fir; for that the latter is dry, while the fir has a sweet taste, and that this is more so, the more the wood is soaked with resin⁵; they go on to

³ Plin. 16. 218.

⁴ Plin. 16. 218 and 219.

⁵ cf. 3. 9. 4.

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δ' ἐσθίεσθαι τερηδόνι πλὴν κοτίνου καὶ ἐλάσ·
 τὰ δὲ οὐ, διὰ τὴν πικρότητα. ἐσθίεται δὲ τὰ μὲν
 ἐν τῇ θαλάττῃ σηπόμενα ὑπὸ τερηδόνος, τὰ δ' ἐν
 τῇ γῇ ὑπὸ σκωλήκων καὶ ὑπὸ θριπῶν· οὐ γάρ
 γίνεται τερηδὼν ἀλλ' ἡ ἐν τῇ θαλάττῃ. ἔστι δὲ
 ἡ τερηδὼν τῷ μὲν μεγέθει μικρόν, κεφαλὴν δ' ἔχει
 5 μεγάλην καὶ ὀδόντας· οἱ δὲ θρίπεις ὅμοιοι τοῖς
 σκώληξιν, ὑφ' ὧν τιτραίνεται κατὰ μικρὸν τὰ
 ξύλα. καὶ ἔστι ταῦτα εὐίατα· πιττοκοπηθέντα
 γάρ ὅταν εἰς τὴν θάλατταν ἐλκυσθῆ στέγει· τὰ
 δὲ ὑπὸ τῶν τερηδόνων ἀνίατα. τῶν δὲ σκωλήκων
 τῶν ἐν τοῖς ξύλοις οἱ μέν εἰσιν ἐκ τῆς οἰκείας
 σήψεως, οἱ δ' ἐντικτόντων ἐτέρων· ἐντίκτει γάρ,
 ὥσπερ καὶ τοῖς δένδροις, ὁ κεράστης καλούμενος,
 ὅταν τιτράνῃ καὶ κοιλάνῃ περιστραφεὶς ὥσπερει
 μυοδόχον. φεύγει δὲ τά τε ὀσμώδη καὶ πικρὰ καὶ
 σκληρὰ διὰ τὸ μὴ δύνασθαι τιτράναι, καθάπερ
 6 τὴν πύξον. φασὶ δὲ καὶ τὴν ἐλάτην φλοϊσθεῖσαν
 ὑπὸ τὴν βλάστησιν ἀσαπῆ διαμένειν ἐν τῷ ὕδατι·
 φανερὸν δὲ γενέσθαι ἐν Φενεῷ τῆς Ἀρκαδίας, ὅτε
 αὐτοῖς ἐλιμνώθη τὸ πεδίον φραχθέντος τοῦ βερέ·
 θρου· τότε γὰρ τὰς γεφύρας ποιοῦντες ἐλατίνας
 καί, ὅταν ἐπαναβαίνῃ τὸ ὕδωρ, ἄλλην καὶ ἄλλην
 ἐφιστάντες, ὡς ἐρράγη καὶ ἀπῆλθε, πάντα εὑρε·
 θῆναι τὰ ξύλα ἀσαπῆ. τοῦτο μὲν οὖν ἐκ συμ·
 πτώματος.

¹ Plin. 16. 220 and 221.

² τιτραίνεται conj. Scal. from G; τιτρένεται UVo.; πεπαίνεται MVAld. ³ cf. 4. 14. 5.

⁴ ὥσπερει μυοδόχον conj. W.; ὥσπερ οἱ μυόχοδοι MSS.; G omits. The word *μυοδόχος* does not occur elsewhere as a subst.

say that all woods are eaten by the *teredon* except the olive, wild or cultivated, and that these woods escape because of their bitter taste.¹ Now woods which decay in sea-water are eaten by the *teredon*, those which decay on land by the *skolex* and *thrips*; for the *teredon* does not occur except in the sea. It is a creature small in size, but has a large head and teeth; the *thrips* resembles the *skolex*, and these creatures gradually bore through² timber. The harm that these do is easy to remedy; for, if the wood is smeared with pitch, it does not let in water when it is dragged down into the sea; but the harm done by the *teredon* cannot be undone. Of the *skolekes* which occur in wood some come from the decay of the wood itself, some from other *skolekes* which engender therein. For these produce their young in timber, as the worm called the 'horned worm'³ does in trees, having bored and scooped out a sort of mouse-hole⁴ by turning round and round. But it avoids wood which has a strong smell or is bitter or hard, such as boxwood, since it is unable to bore through it. They say too that the wood of the silver-fir, if barked just before the time of budding, remains in water without decaying, and that this was clearly seen at Pheneos in Arcadia, when their plain was turned into a lake since the outlet was blocked up.⁵ For at that time they made⁶ their bridges of this wood, and, as the water rose, they placed more and more atop of them, and, when the water burst its way through and disappeared, all the wood was found to be undecayed. This fact then became known by means of an accident.

⁵ cf. 3. 1. 2. *φραχθέντος* conj. Sch.; *θραχθέντος* Ald. H.

⁶ *ποιοῦντες, ἐφιστάντες* nom. pendens.

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7. 'Εν Τύλῳ δὲ τῇ νήσῳ τῇ περὶ τὴν Ἀραβίαν εἶναι τί φασι ξύλον ἐξ οὐ τὰ πλοῖα ναυπηγοῦνται· τοῦτο δὲ ἐν μὲν τῇ θαλάττῃ σχεδὸν ἀσηπτον εἶναι· διαμένει γὰρ ἔτη πλείω ἢ διακόσια καταβυθιζόμενον· ἐὰν δὲ ἔξω, χρόνιον μὲν θâττον δὲ σήπεται. (θαυμαστὸν δὲ καὶ ἔτερον λέγουσι, οὐδὲν δὲ πρὸς τὴν σῆψιν. εἶναι γάρ τι δένδρον ἐξ οὐ τὰς βακτηρίας τέμνεσθαι, καὶ γίνεσθαι καλὰς σφόδρα ποικιλίαν τινὰ ἔχούσας ὄμοίαν τῷ τοῦ τίγριος δέρματι· βαρὺ δὲ σφόδρα τὸ ξύλον τοῦτο· ὅταν δέ τις ρίψῃ πρὸς στερεώτερον τόπον, κατάγνυσθαι καθάπερ τὰ κεράμια.)

8. Καὶ τὸ τῆς μυρίκης δὲ ξύλον οὐχ ὥσπερ ἐνταῦθα ἀσθενές, ἀλλ’ ἵσχυρὸν ὥσπερ πρίνινον ἢ καὶ ἄλλο τι τῶν ἵσχυρῶν. τοῦτο μὲν οὖν ἄμα μηνύει χώρας τε καὶ ἀέρος διαφορὰς καὶ δυνάμεις. τῶν δὲ ὄμογενῶν ξύλων, οἷον δρυΐνων πευκίνων, ὅταν ταριχεύωνται—ταριχεύουσι γὰρ οὐκ ἐν ἴσῳ βάθει πάντα δύοντες τῆς θαλάττης, ἀλλὰ τὰ μὲν πρὸς αὐτῇ τῇ γῇ, τὰ δὲ μικρὸν ἀνωτέρω, τὰ δ’ ἐν πλείονι βάθει· πάντων δὲ τὰ πρὸς τὴν ρίζαν θâττον δύεται καθ’ ὑδατος, καὶ ἐπινῆ μᾶλλον ρέπει κάτω.

V. Ἐστι δὲ τὰ μὲν εὔεργα τῶν ξύλων, τὰ δὲ δύσεργα· εὔεργα μὲν τὰ μαλακά, καὶ πάντων

¹ Plin. 16. 221; cf. 4. 7. 7.

² Teak. See Index App. (22).

³ Calamander-wood. See Index App. (23).

¹ In the island of Tylos off the Arabian coast they say that there is a kind of wood² of which they build their ships, and that in sea-water this is almost proof against decay; for it lasts more than 200 years if it is kept under water, while, if it is kept out of water, it decays sooner, though not for some time. They also tell of another strange thing, though it has nothing to do with the question of decay: they say that there is a certain tree,³ of which they cut their staves, and that these are very handsome, having a variegated appearance like the tiger's skin; and that this wood is exceedingly heavy, yet when one throws it down on hard ground⁴ it breaks in pieces like pottery.

Moreover, the wood of the tamarisk⁵ is not weak there, as it is in our country, but is as strong as kermes-oak or any other strong wood. Now this illustrates also the difference in properties caused by country and climate. Moreover when wood, such as that of oak or fir, is soaked in brine—not all being soaked at the same depth in the sea, but some of it close to shore, some rather further out, and some at a still greater depth—⁶ in all cases the parts of the tree nearest the root (whichever tree it is) sink quicker under water, and even if they float, have a greater tendency to sink.

Which kinds of wood are easy and which hard to work. Of the core and its effects.

V. Some wood is easy to work, some difficult. Those woods which are soft are easy, and especially

⁴ πρὸς στρεψ. τόπον can hardly be sound: ? 'on something harder than itself.'

⁵ See Index, μυρίκη (2).

⁶ Plin. 16. 186.

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μάλιστα φίλυρα· δύσεργα δὲ καὶ τὰ σκληρὰ καὶ τὰ δέξιαδη καὶ οὕλας ἔχοντα συστροφάς· δυσεργότατα δὲ ἀρία καὶ δρῦς, ὡς δὲ κατὰ μέρος ὁ τῆς πεύκης ὅξος καὶ τῆς ἐλάτης. ἀεὶ δὲ τῶν ὁμογενῶν τὸ μαλακώτερον τοῦ σκληροτέρου κρείττον· σαρκωδέστερον γάρ· καὶ εὐθὺς σκοποῦνται τὰς σανίδας οἱ τέκτονες οὕτως. τὰ δὲ μοχθηρὰ σιδήρια δύναται τέμνειν τὰ σκληρὰ μᾶλλον τῶν μαλακῶν· ἀνίησι γάρ ἐν τοῖς μαλακοῖς, ὥσπερ ἐλέχθη περὶ τῆς φιλύρας, παρακονῷ δὲ μάλιστα τὰ σκληρά· δι' ὃ καὶ οἱ σκυτοτόμοι ποιοῦνται τοὺς πίνακας ἀχράδος.

2 Μήτραν δὲ πάντα μὲν ἔχειν φασὶν οἱ τέκτονες φανερὰν δ' εἶναι μάλιστα ἐν τῇ ἐλάτῃ· φαίνεσθαι γὰρ οἰνον φλοιώδη τινὰ τὴν σύνθεσιν αὐτῆς τῶν κύκλων. ἐν ἐλάᾳ δὲ καὶ πύξιν· ηκιστα γὰρ ἐλκεσθαι ταῦτα τῶν ξύλων. ἔστι δὲ τὸ ἐλκεσθαι τὸ συμπεριίστασθαι κινουμένης τῆς μήτρας. ζῆ γὰρ ὡς ἔοικεν ἐπὶ χρόνον πολύν· δι' ὃ πανταχόθεν μὲν ἄμα μάλιστα δ' ἐκ τῶν θυρωμάτων ἔξαιροῦσιν, ὅπως ἀστραβῆ ἡ· καὶ διὰ τοῦτο σχίζουσιν.

3 Ἀτοπον δ' ἀν δόξειεν ὅτι ἐν μὲν τοῖς ξύλοις τοῖς στρογγύλοις ἄλυπος ἡ μήτρα καὶ ἀκίνητος, ἐν δὲ τοῖς παρακινηθεῖσιν, ἐὰν μὴ δλως ἔξαιρεθῇ,

¹ 5. 3. 3.

² τὰ σκληρὰ conj. Sch. from G (?); ταῦτα P₂Ald.H.

³ ἔχειν conj. Sch.; ἔχει Ald.H.

⁴ ἐλάᾳν conj. Scal. from G; ἐλάτην Ald.H.

⁵ i.e. and this happens less in woods which have little core. ⁶ ἄμα (=δμοίως) MSS.; αὐτὴν conj. W.

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that of the lime; those are difficult which are hard and have many knots and a compact and twisted grain. The most difficult woods are those of *aria* (holm-oak) and oak, and the knotty parts of the fir and silver-fir. The softer part of any given tree is always better than the harder, since it is fleshier: and carpenters can thus at once mark the parts suitable for planks. Inferior iron tools can cut hard wood better than soft: for on soft wood tools lose their edge, as was said¹ in speaking of the lime, while hard woods² actually sharpen it: wherefore cobblers make their strops of wild pear.

Carpenters say that all woods have³ a core, but that it is most plainly seen in the silver-fir, in which one can detect a sort of bark-like character in the rings. In olive box and such woods this is not so obvious; wherefore they say that box and olive⁴ lack this tendency; for that these woods are less apt to 'draw' than any others. 'Drawing' is the closing in of the wood as the core is disturbed.⁵ For since the core remains alive, it appears, for a long time, it is always removed from any article whatever made of this wood,⁶ but especially from doors,⁷ so that they may not warp⁸: and that is why the wood is split.⁹

It might seem strange that in 'round'¹⁰ timber the core does no harm and so is left undisturbed, while in wood whose texture has been interfered with,¹¹ unless it is taken out altogether, it causes

⁷ θυρωμάτων conj. Sch.; γυρωμάτων Ald. cf. 4. 1. 2; Plin. 16. 225, *abietem valvarum paginis aptissimam*.

⁸ ἀστραβῆς conj. Dalec.; ἀστραβῆ UMVAld.

⁹ i.e. to extract the core. ¹⁰ See below, § 5.

¹¹ παρακινηθεῖσι, i.e. by splitting or sawing. πελεκηθεῖσι conj. W.

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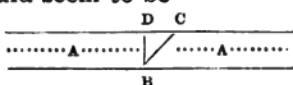
κινεῖ καὶ παραστρέφει· μᾶλλον γὰρ εἰκὸς γυμνωθεῖσαν ἀποθυήσκειν. ὅμως δὲ οὕτι γε ἴστοι καὶ αἱ κεραῖαι ἔξαιρεθείσης ἀχρεῖοι. τοῦτο δὲ κατὰ συμβεβηκός, ὅτι χιτῶνας ἔχει πλείους, ἴσχυρότατον δὲ καὶ λεπτότατον δὲ τὸν ἔσχατον, ξηρότατον γάρ, καὶ τοὺς ἄλλους ἀνὰ λόγον. ὅταν οὖν ⁴ σχισθῇ, περιαιρεῖται τὰ ξηρότατα. εἰ δὲ ἡ μήτρα διὰ τὸ ξηρὸν σκεπτέον. διαστρέφει δὲ ἐλκομένη τὰ ξύλα καὶ ἐν τοῖς σχιστοῖς καὶ πριστοῖς, ὅταν μὴ ὡς δεῖ πρίωσιν δεῖ γὰρ ὀρθὴν τὴν πρίσιν εἶναι καὶ μὴ πλαγίαν. οἶον οὕσης τῆς μήτρας ἐφ' ἣν τὸ a, μὴ παρὰ τὴν βγ τέμνειν, ἀλλὰ παρὰ τὴν βδ. φθείρεσθαι γὰρ οὕτω φασίν, ἐκείνως δὲ ζῆν. ὅτι δὲ πᾶν ξύλον ἔχει μήτραν ἐκ τούτων οἰονται· φανερὸν γάρ ἔστι καὶ τὰ μὴ δοκοῦντα πάντ' ἔχειν, οἷον πύξιν λωτὸν πρῖνον. σημεῖον δέ· τοὺς γὰρ στρόφιγγας τῶν θυρῶν τῶν πολυτελῶν ποιοῦσι μὲν ἐκ τούτων, συγγράφονται δὲ οἱ ἀρχιτέκτονες οὕτως <μὴ> ἐκ μήτρας. ταύτο δὲ τοῦτο σημεῖον καὶ ὅτι πᾶσα μήτρα ἔλκεται, καὶ αἱ τῶν σκληροτάτων, ἀς δή τινες καρδίας καλοῦσι. παντὸς δὲ

¹ And so cause no trouble.

² cf. 5. 1. 6. πλείους conj. Sch. from G; ἄλλους Ald. H.

³ Text probably defective; ? insert ἔξηρέθη after ξηρὸν.

⁴ The figure would seem to be



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disturbance and warping: it were rather to be expected that it would die¹ when exposed. Yet it is a fact that masts and yard-arms are useless, if it has been removed from the wood of which they are made. This is however an accidental exception, because the wood in question has several coats,² of which the strongest and also thinnest is the outermost, since this is the driest, while the other coats are strong and thin in proportion to their nearness to the outermost. If therefore the wood be split, the driest parts are necessarily stripped off. Whether however in the other case the object of removing the core is to secure dryness is matter for enquiry.³ However, when the core 'draws,' it twists the wood, whether it has been split or sawn, if the sawing is improperly performed: the saw-cut should be made straight and not slantwise. 'Thus, if the core be represented by the line *A*, the cut must be made along the line *BD*, and not along the line *BC*: for in that case, they say, the core will be destroyed, while, if cut in the other way, it will live. For this reason men think that every wood has a core: for it is clear that those which do not seem to possess one nevertheless have it, as box nettle-tree kermes-oak: a proof of this is the fact that men make of these woods the pivots⁵ of expensive doors, and accordingly⁶ the headcraftsmen specify that wood with a core shall not⁷ be used. This is also a proof that any core 'draws,' even those of the hardest woods, which some call the heart. In almost every wood, even

⁵ cf. 5. 3. 5. *στρόφιγξ* here at least probably means 'pivot and socket.'

⁶ *οὗτως* Ald.H.; *αὐτοὺς* conj. W.

⁷ *μὴ* add. W.

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ώς εἰπεῖν ξύλου σκληροτάτη καὶ μανοτάτη ἡ μήτρα, καὶ αὐτῆς τῆς ἐλάτης· μανοτάτη μὲν οὖν, ὅτι τὰς ἵνας ἔχει καὶ διὰ πολλοῦ καὶ τὸ σαρκῶδες τὸ ἀνὰ μέσον πολύ· σκληροτάτη δέ, ὅτι καὶ αἱ ἵνες σκληρόταται καὶ τὸ σαρκῶδες· δι’ ὃ καὶ οἱ ἀρχιτέκτονες συγγράφονται παραιρεῖν τὰ πρὸς τὴν μήτραν, ὅπως λάβωσι τοῦ ξύλου τὸ πυκνότατον καὶ μαλακώτατον.

6 Τῶν δὲ ξύλων τὰ μὲν σχιστὰ τὰ δὲ πελεκητὰ τὰ δὲ στρογγύλα· σχιστὰ μέν, ὅσα διαιροῦντες κατὰ τὸ μέσον πρίζουσι· πελεκητὰ δέ, ὅσων ἀποπελεκῶσι τὰ ἔξω· στρογγύλα δὲ δῆλον ὅτι τὰ ὅλως ἄψαυστα. τούτων δὲ τὰ σχιστὰ μὲν ὅλως ἀρραγῆ διὰ τὸ γυμνωθεῖσαν τὴν μήτραν ξηραίνεσθαι καὶ ἀποθυήσκειν· τὰ δὲ πελεκητὰ καὶ τὰ στρογγύλα ῥήγνυται· μᾶλλον δὲ πολὺ τὰ στρογγύλα διὰ τὸ ἐναπειλῆθαι τὴν μήτραν· οὐδὲν γὰρ ὅτι τῶν ἀπάντων οὐ ῥήγνυται. τοῖς δὲ λωτίνοις καὶ τοῖς ἄλλοις οἷς εἰς τοὺς στρόφιγγας χρῶνται πρὸς τὸ μὴ ῥήγνυσθαι βόλβιτον περιπλάττουσιν, ὅπως ἀναξηρανθῇ καὶ διαπιευσθῇ κατὰ μικρὸν ἡ ἐκ τῆς μήτρας ὑγρότης. ἡ μὲν οὖν μήτρα τοιαύτην ἔχει δύναμιν.

VI. Βάρος δὲ ἐνεγκεῖν ἵσχυρὰ καὶ ἡ ἐλάτη καὶ ἡ πεύκη πλάγιαι τιθέμεναι· οὐδὲν γὰρ ἐν-

¹ ξύλου σκληροτάτη conj. Sch. from G; ξύλου σκληρότατον UΜV: so Ald. omitting καὶ.

² ἀποπελεκῶσι conj. Sch.; ἀποπλέκωσι UΜ; ἀποπλέκουσι Ald.; ἀποπελέκουσι mBas. ³ cf. C.P. 5. 17. 2.

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in that of the silver-fir, the core is the hardest part,¹ and the part which has the least fibrous texture:—it is least fibrous because the fibres are far apart and there is a good deal of fleshy matter between them, while it is the hardest part because the fibres and the fleshy substance are the hardest parts. Wherefore the headercraftsmen specify that the core and the parts next it are to be removed, that they may secure the closest and softest part of the wood.

Timber is either ‘cleft,’ ‘hewn,’ or ‘round’: it is called ‘cleft,’ when in making division they saw it down the middle, ‘hewn’ when they hew off² the outer parts, while ‘round’ clearly signifies wood which has not been touched at all. Of these, ‘cleft’ wood³ is not at all liable to split, because the core when exposed dries and dies: but ‘hewn’ and ‘round’ wood are apt to split, and especially ‘round’ wood, because the core is included in it: no kind of timber indeed is altogether incapable of splitting. The wood of the nettle-tree and other kinds which are used for making pivots for doors are smeared⁴ with cow-dung to prevent their splitting: the object being that the moisture due to the core may be gradually dried up⁵ and evaporated. Such are the natural properties of the core.

Which woods can best support weight.

VI. ⁶ For bearing weight silver-fir and fir are strong woods, when set slantwise⁷: for they do not give like

⁴ περιπλάττονσι conj. Sch. from G; περιπάττονσιν Ald. H. Plin. 16. 222. ⁵ ἀναξηρανθῆ conj. Sch.; ἀναξηραίη Ald. H.

⁶ Plin. 16. 222-224.

⁷ e.g. as a strut. πλάγιαι conj. Sch. from Plin. l.c.; ἀπαλαῖ Ald. H.

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διδόασιν, ὥσπερ ἡ δρῦς καὶ τὰ γεώδη, ἀλλ' ἀντωθοῦσι· σημεῖον δὲ ὅτι οὐδέποτε ρήγνυνται, καθάπερ ἐλάα καὶ δρῦς, ἀλλὰ πρότερον σήπονται καὶ ἄλλως ἀπαυδώσιν. ἵσχυρὸν δὲ καὶ ὁ φοῖνιξ· ἀνάπαλιν γάρ ἡ κάμψις ἡ τοῖς ἄλλοις γίνεται· τὰ μὲν γάρ εἰς τὰ κάτω κάμπτεται, ὁ δὲ φοῖνιξ εἰς τὰ ἄνω. φασὶ δὲ καὶ τὴν πεύκην καὶ τὴν ἐλάτην ἀντωθεῖν. τὸ δὲ τῆς Εὐβοϊκῆς καρύας, γίνεται γάρ μέγα καὶ χρῶνται πρὸς τὴν ἔρεψιν, ὅταν μέλλῃ ρήγνυνθαι ψοφεῖν ὥστε προαισθάνεσθαι πρότερον· ὅπερ καὶ ἐν Ἀντανδρῷ συνέπεσεν ἐν τῷ βαλανείῳ καὶ πάντες ἔξεπήδησαν. ἵσχυρὸν δὲ καὶ τὸ τῆς συκῆς πλὴν εἰς ὄρθον.

2 Ἡ δὲ ἐλάτη μάλιστα ὡς εἰπεῖν ἵσχυρόν. πρὸς δὲ τὰς τῶν τεκτόνων χρείας ἔχέκολλον μὲν μάλιστα ἡ πεύκη διά τε τὴν μανότητα καὶ τὴν εὐθυπορίαν· οὐδὲ γάρ ὅλως οὐδὲ ρήγνυνθαι φασιν ἐὰν κολληθῇ. εὐτορνότατον δὲ φιλύκη, καὶ ἡ λευκότης ὥσπερ ἡ τοῦ κηλάστρου. τῶν δὲ ἄλλων ἡ φίλυρα· τὸ γάρ ὅλον εὔεργον, ὥσπερ ἐλέχθη, διὰ μαλακότητα. εὔκαμπτα δὲ ὡς μὲν ἀπλῶς εἰπεῖν ὅσα γλίσχρα. διαφέρειν δὲ δοκεῖ συκάμινος καὶ ἐρινεός, δι' ὃ καὶ τὰ ἵκρια καὶ τὰς στεφάνας καὶ ὅλως ὅσα περὶ τὸν κόσμον ἐκ τούτων ποιοῦσι.

3 Εὔπριστα δὲ καὶ εὔσχιστα τὰ ἐνικμότερα τῶν

¹ i.e. the strut becomes concave or convex respectively.
cf. Xen. *Cyr.* 7. 5. 11.

² i.e. it cannot be used as a strut, or it would 'buckle,' though it will stand a vertical strain.

³ Plin. 16. 225.

⁴ cf. C.P. 5. 17. 3. εὐθυποράτατα: εὐθυπορίαν.

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oak and other woods which contain mineral matter, but make good resistance. A proof of this is that they never split like olive and oak, but decay first or fail in some other way. Palm-wood is also strong, for it bends the opposite way to other woods : they bend downwards, palm-wood upwards.¹ It is said that fir and silver-fir also have an upward thrust. As to the sweet chestnut, which grows tall and is used for roofing, it is said that when it is about to split, it makes a noise, so that men are forewarned : this occurred once at Antandros at the baths, and all those present rushed out. Fig-wood is also strong, but only when set upright.²

Of the woods best suited for the carpenter's various purposes.

³ The wood of the silver-fir may be called the strongest of all. But for the carpenter's purposes fir best takes glue because of its open texture and the straightness of its pores⁴; for they say that it never by any chance comes apart when it is glued. Alaternus⁵ is the easiest wood for turning, and its whiteness is like that of the holly. Of the rest lime is the easiest, the whole tree, as was said, being easy to work because of the softness of the wood. In general those woods which are tough are easy to bend. The mulberry and the wild fig seem to be specially so; wherefore they make of these theatre-seats,⁶ the hoops of garlands, and, in general, things for ornament.

⁷ Woods which have a fair amount of moisture in them are easier to saw or split than those which

⁵ cf. 5. 7. 7.

⁶ Rendering doubtful. *τεκτία* has probably here some unknown meaning, on which the sense of *κόσμου* depends.

⁷ Plin. 16. 227.

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πάμπαν ξηρῶν· τὰ μὲν γὰρ παύονται, τὰ δὲ
ἴστανται· τὰ δὲ χλωρὰ λίαν συμμύει καὶ ἐνέχε-
ται ἐν τοῖς ὁδοῦσι τὰ πρίσματα καὶ ἐμπλάττει,
δι’ ὃ καὶ παραλλάττουσιν ἀλλήλων τοὺς ὁδόντας
ἴνα ἔξαγηται. ἔστι δὲ καὶ δυστρυπητότερα τὰ
λίαν χλωρά· βραδέως γὰρ ἀναφέρεται τὰ ἐκτρυ-
πήματα διὰ τὸ βαρέα εἶναι· τῶν δὲ ξηρῶν ταχέως
καὶ εὐθὺς ὁ ἀὴρ ἀναθερμαινόμενος ἀναδίδωσι·
πάλιν δὲ τὰ λίαν ξηρὰ διὰ τὴν σκληρότητα
δύσπριστα· καθάπερ γὰρ ὅστρακον συμβαίνει
πρίειν, δι’ ὃ καὶ τρυπῶντες ἐπιβρέχουσιν.

4 Εὔπελεκητότερα δὲ καὶ εὐτορυνότερα καὶ εὐξο-
ώτερα τὰ χλωρά· προσκάθηται τε γὰρ τὸ τορνευ-
τήριον μᾶλλον καὶ οὐκ ἀποπηδᾶ· καὶ ἡ πελέκησις
τῶν μαλακωτέρων ῥάων, καὶ ἡ ξέσις δὲ ὄμοιώς καὶ
ἔτι λειοτέρα. ἴσχυρότατον δὲ καὶ ἡ κράνεια, τῶν
δὲ ἄλλων οὐχ ἡκιστα ἡ πτελέα, δι’ ὃ καὶ τοὺς
στροφέας, ὥσπερ ἐλέχθη, ταῖς θύραις πτελεῖνος
ποιοῦσιν. ὑγρότατον δὲ μελία καὶ ὀξύη· καὶ γὰρ
τὰ κλινάρια τὰ ἐνδιδόντα ἐκ τούτων.

VII. "Ολας δὲ πρὸς ποῖα τῆς ὕλης ἐκάστη
χρησίμη καὶ ποία ναυπηγήσιμος καὶ οἰκοδομική,
πλείστη γὰρ αὕτη ἡ χρεία καὶ ἐν μεγίστοις,
πειρατέον εἰπεῖν, ἀφορίζοντα καθ' ἔκαστον τὸ
χρήσιμον.

'Ελάτη μὲν οὖν καὶ πεύκη καὶ κέδρος ὡς ἀπλῶς

¹ παύονται can hardly be right: Plin. *l.c.* seems to have had a fuller text.

² ἐμπλάττει: cf. *de Sens.* 66.

are altogether dry: for the latter give,¹ while the former resist. Wood which is too green closes up again when sawn, and the sawdust catches in the saw's teeth and clogs² them; wherefore the teeth of the saw are set alternate ways, to get rid of the sawdust. Wood which is too green is also harder to bore holes in; for the auger's dust is only brought up slowly, because it is heavy; while, if the wood is dry, the air gets warmed by the boring and brings it up readily and at once. On the other hand, wood which is over dry³ is hard to saw because of its hardness: for it is like sawing through earthenware; wherefore they wet the auger when using it.

However green wood is easier to work with the axe the chisel or the plane; for the chisel gets a better hold and does not slip off. Again softer woods are easier for the axe and for smoothing,⁴ and also a better polished surface is obtained. The cornelian cherry is also a very strong wood, and among the rest elm-wood is the strongest; wherefore, as was said,⁵ they make the 'hinges' for doors of elm-wood. Manna-ash and beech have very moist wood, for of these they make elastic bedsteads.

Of the woods used in ship-building.

VII. Next we must endeavour to say in a general way, distinguishing the several uses, for which purposes each kind of timber is serviceable, which is of use for ship-building, which for house-building: for these uses extend far and are important.

Now silver-fir, fir and Syrian cedar⁶ are, generally

³ τὰ λίαν ξηρὰ conj. St.; λεῖα καὶ ξηρὰ Ald. H.

⁴ Sc. with the carpenter's axe.

⁵ 5. 3. 5. ⁶ See Index.

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εἰπεῖν ναυπηγήσιμα· τὰς μὲν γὰρ τριήρεις καὶ τὰ μακρὰ πλοῖα ἐλάτινα ποιοῦσι διὰ κουφότητα, τὰ δὲ στρογγύλα πεύκινα διὰ τὸ ἀσαπές¹ ἔνιοι δὲ καὶ τὰς τριήρεις διὰ τὸ μὴ εὐπορεῦν ἐλάτης. οἱ δὲ κατὰ Συρίαν καὶ Φοινίκην ἐκ κέδρου· σπανίζουσι γὰρ καὶ πεύκης. οἱ δ' ἐν Κύπρῳ πίτυος· ταύτην γὰρ ή νῆσος ἔχει καὶ δοκεῖ κρείττων εἶναι τῆς 2 πεύκης. καὶ τὰ μὲν ἄλλα ἐκ τούτων· τὴν δὲ τρόπιν τριήρει μὲν δρυΐνην, ἵνα ἀντέχῃ πρὸς τὰς νεωλκίας, ταῖς δὲ ὀλκάσι πευκίνην· ὑποτιθέασι δ' ἔτι καὶ δρυΐνην ἐπάν νεωλκῶσι, ταῖς δ' ἐλάττοσιν ὀξυΐνην· καὶ ὅλως ἐκ τούτου τὸ χέλυσμα.

Οὐχ ἄπτεται δὲ οὐδὲ κατὰ τὴν κόλλησιν ὁμοίως τὸ δρύϊνον τῶν πευκίνων καὶ ἐλατίνων· τὰ μὲν γὰρ πυκνὰ τὰ δὲ μανά, καὶ τὰ μὲν ὅμοια τὰ δ' οὐ. δεῖ δὲ ὁμοιοπαθῆ εἶναι τὰ μέλλοντα συμφύεσθαι καὶ μὴ ἐναντία, καθαπέρανεὶ λίθον καὶ ξύλον.

3 Ἡ δὲ τορνεία τοῖς μὲν πλοίοις γίνεται συκαμίνου μελίας πτελέας πλατάνου· γλισχρότητα γὰρ ἔχειν δεῖ καὶ ισχύν. χειρίστη δὲ ή τῆς πλατάνου· ταχὺ γὰρ σήπτεται. ταῖς δὲ τριήρεσιν ἔνιοι καὶ πιτυίνας ποιοῦσι διὰ τὸ ἐλαφρόν. τὸ δὲ στερέωμα, πρὸς ὡς τὸ χέλυσμα, καὶ τὰς ἐπωτίδας, μελίας καὶ συκαμίνου καὶ πτελέας· ισχυρὰ

¹ τριήρει conj. W.; τριήρη U; τριήρης MV; τριήρεσι Ald.

² ταῖς δ' ἐλάττοσιν ὀξυΐνην conj. W. (τοῖς Sch.); τοῖς μὲν ἐλάττοσιν ὀξύη Ald. cf. Plin. 16. 226.

³ χέλυσμα, a temporary covering for the bottom: so Poll. and Hesych. explain.

speaking, useful for ship-building; for triremes and long ships are made of silver-fir, because of its lightness, and merchant ships of fir, because it does not decay; while some make triremes of it also because they are ill provided with silver-fir. The people of Syria and Phoenicia use Syrian cedar, since they cannot obtain much fir either; while the people of Cyprus use Aleppo pine, since their island provides this and it seems to be superior to their fir. Most parts are made of these woods; but the keel for a trireme¹ is made of oak, that it may stand the hauling; and for merchantmen it is made of fir. However they put an oaken keel under this when they are hauling, or for smaller vessels a keel of beech;² and the sheathing³ is made entirely of this wood.

⁴ (However oak-wood does not join well with glue on to fir or silver-fir; for the one is of close, the other of open grain, the one is uniform, the other not so; whereas things which are to be made into one piece should be of similar character, and not of opposite character, like wood and stone.)

The work of bentwood⁵ for vessels is made of mulberry manna-ash elm or plane; for it must be tough and strong. That made of plane-wood is the worst, since it soon decays. For triremes some make such parts of Aleppo pine because of its lightness. The cutwater,⁶ to which the sheathing is attached,⁷ and the catheads are made of manna-ash mulberry

⁴ This sentence is out of place; its right place is perhaps at the end of § 4.

⁵ *τορυεῖα*; but the word is perhaps corrupt: one would expect the name of some part of the vessel.

⁶ *στερέωμα*: apparently the fore part of the keel; = *στεῖρα*.

⁷ *πρὸς φ. τὸ χέλυσμα* conj. W. after Scal.; *πρόσω. τὸ σχέλυσμα* Ald. (*σχέλομα* M, *χέλυσμα* U) *πρόσω. τὸ δὲ χέλυσμα* mBas.

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γὰρ δεῖ ταῦτ' εἶναι. ναυπηγήσιμος μὲν οὖν ὅλη σχεδὸν αὕτη.

4 Οἰκοδομικὴ δὲ πολλῷ πλείων, ἐλάτη τε καὶ πεύκη καὶ κέδρος, ἔτι κυπάριττος δρῦς καὶ ἄρκευθος· ώς δ' ἀπλῶς εἰπεῖν πᾶσα χρησίμη πλὴν εἴ τις ἀσθενής πάμπαν· οὐκ εἰς ταῦτὸ γὰρ πᾶσαι, καθάπερ οὐδέ ἐπὶ τῆς ναυπηγίας. αἱ δ' ἄλλαι πρὸς τὰ ἴδια τῶν τεχνῶν, οἷον σκεύη καὶ ὄργανα καὶ εἴ τι τοιοῦτον ἔτερον. πρὸς πλεῖστα δὲ σχεδὸν ἡ ἐλάτη παρέχεται χρείαν· καὶ γὰρ πρὸς τοὺς πίνακας τοὺς γραφομένους. τεκτονικὴ μὲν οὖν ἡ παλαιοτάτη κρατίστη, ἐὰν η ἀσαπής· εὐθετεῖ γὰρ ώς εἰπεῖν πᾶσι χρῆσθαι· ναυπηγικῆ δὲ διὰ τὴν κάμψιν ἐνικμοτέρᾳ ἀναγκαῖον· ἐπεὶ πρός γε τὴν κόλλησιν ἡ ἔνηροτέρα συμφέρει. ἵσταται γὰρ καὶ τὰ ναυπηγούμενα καὶ ὅταν συμπαγῆ καθελκυσθέντα συμμύει καὶ στέγει, πλὴν ἐὰν μὴ παντάπασιν ἔξικμασθῇ· τότε δὲ οὐ δέχεται κόλλησιν ἡ οὐχ ὄμοιώς.

5 Δεῖ δὲ καὶ καθ' ἔκαστον λαμβάνειν εἰς ποῦα χρήσιμός ἐστιν. ἐλάτη μὲν οὖν καὶ πεύκη, καθάπερ εἴρηται, καὶ πρὸς ναυπηγίαν καὶ πρὸς

¹ ἐλάτη . . . ἄρκευθος conj. W.; ἐλάτη τε καὶ πεύκη καὶ κέδρος ἔτι κυπάριττος δρῦς πεύκη καὶ κέδρος ἄρκευθος U; ἐλάτη τε καὶ πεύκη καὶ κέδρος καὶ ἄρκευθος Ald. H.: so also MV, omitting καὶ before ἄρκ.

² ὡς δ' ἀπλῶς conj. Sch.; ἀπλῶς δ' ὡς Ald.

³ καὶ νῦν conj. Sch.; καὶ νῦν Ald.

⁴ συμπαγῆ conj. W., which he renders 'when it has been glued together'; συμπίῃ Ald. G's reading was evidently different.

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and elm; for these parts must be strong. Such then is the timber used in ship-building.

Of the woods used in house-building.

For house-building a much greater variety is used, silver-fir fir and prickly cedar; also cypress oak and Phoenician cedar.¹ In fact, to speak generally,² any wood is here of service, unless it is altogether weak: for there are various purposes for which different woods are serviceable, just as there are in ship-building. While other woods are serviceable for special articles belonging to various crafts, such as furniture tools and the like, the wood of silver-fir is of use for almost more purposes than any other wood; for it is even used for painters' tablets. For carpentry the oldest wood is the best, provided that it has not decayed; for it is convenient for almost anyone to use. But for ship-building, where bending is necessary, one must use wood which contains more moisture (though, where glue is to be used, drier wood is convenient). For timber-work for ships is set to stand when it is newly³ made: then, when it has become firmly united,⁴ it is dragged down to the water, and then it closes up and becomes watertight,—unless⁵ all the moisture has been dried out of it, in which case it will not take the glue, or will not take it so well.

Of the uses of the wood of particular trees.

But we must consider for what purposes⁶ each several wood is serviceable. Silver-fir and fir, as has been said, are suitable both for ship-building house-

⁵ πλὴν ἔαν μὴ conj. W.; π. ἔαν τε M; π. ἔαν γε Ald.

⁶ i.e. apart from ship-building and house-building, in which several woods are used.

οἰκοδομίαν καὶ ἔτι πρὸς ἄλλα τῶν ἔργων, εἰς πλείω δὲ ἡ ἐλάτη. πίτυι δὲ χρῶνται μὲν εἰς ἄμφω καὶ οὐχ ἡττον εἰς ναυπηγίαν, οὐ μὴν ἀλλὰ ταχὺ διασήπεται. δρῦς δὲ πρὸς οἰκοδομίαν καὶ πρὸς ναυπηγίαν ἔτι τε πρὸς τὰ κατὰ γῆς κατορυττόμενα. φίλυρα δὲ πρὸς τὰ σανιδώματα τῶν μακρῶν πλοίων καὶ πρὸς κιβώτια καὶ πρὸς τὴν τῶν μέτρων κατασκευήν. ἔχει δὲ καὶ τὸν φλοιὸν χρήσιμον πρός τε τὰ σχοινία καὶ πρὸς τὰς κίστας· ποιοῦσι γάρ ἐξ αὐτῆς.

6 Σφένδαμνός τε καὶ ζυγία πρὸς κλινοπηγίαν καὶ πρὸς τὰ ζυγὰ τῶν λοφούρων. μίλος δὲ εἰς παρακολλήματα κιβώτων καὶ ὑποβάθρους καὶ ὅλως τοῖς τοιούτοις. πρῦνος δὲ πρὸς ἄξονας ταῖς μονοστρόφοις ἀμάξαις καὶ εἰς ζυγὰ λύραις καὶ ψαλτηρίοις. ὁξύη δὲ πρὸς ἀμαξοπηγίαν καὶ διφροπηγίαν τὴν εὔτελην. πτελέα δὲ πρὸς θυροπηγίαν καὶ γαλεάγρας· χρῶνται δὲ καὶ εἰς τὰ ἀμάξικὰ μετρίως. πηδὸς δὲ εἰς ἄξονάς τε ταῖς ἀμάξαις καὶ εἰς ἔλκηθρα τοῖς ἀρότροις. ἀνδράχλη δὲ ταῖς γυναιξὶν εἰς τὰ περὶ τοὺς ίστούς. ἀρκευθος δὲ εἰς τεκτονίας καὶ εἰς τὰ ὑπαίθρια καὶ εἰς τὰ κατορυττόμενα κατὰ γῆς διὰ τὸ ἀσπάτες.
7 ὡσαύτως δὲ καὶ ἡ Εὐβοϊκὴ καρύα, καὶ πρὸς γε τὴν κατόρυξιν ἔτι μᾶλλον ἀσπάτης. πύξω δὲ χρῶνται μὲν πρὸς ἔνια, οὐ μὴν ἀλλ’ ἡ γε ἐν τῷ Ὄλύμπῳ γινομένη διὰ τὸ βραχεῖά τε εἶναι καὶ ὀξώδης ἀχρεῖος. τερμίνθω δέ οὐδὲν χρῶνται

¹ κίστας: cf. 3. 13. 1; perhaps 'hampers,' cf. 5. 7. 7.

² παρακολλήματα: lit. 'things glued on.'

³ Plin. 16. 229.

⁴ ταῖς μονοστρόφοις ἀμάξαις: or, perhaps, 'the wheels of

building and also for other kinds of work, but silver-fir is of use for more purposes than fir. Aleppo pine is used for both kinds of building, but especially for ship-building, yet it soon rots. Oak is used for house-building, for ship-building, and also for underground work; lime for the deck-planks of long ships, for boxes, and for the manufacture of measures; its bark is also useful for ropes and writing-cases,¹ for these are sometimes made of it.

Maple and *zygia* are used for making beds and the yokes of beasts of burden: yew for the ornamental work attached² to chests and footstools and the like: kermes-oak³ for the axles of wheelbarrows⁴ and the cross-bars of lyres and psalteries: beech for making waggons and cheap carts: elm for making doors and weasel-traps, and to some extent it is also used for waggon work; *pedos*⁵ for waggon-axles and the stocks of ploughs: andrachne is used for women for parts of the loom: Phoenician cedar for carpenters' work⁶ and for work which is either to be exposed to the air or buried underground, because it does not decay. Similarly the sweet chestnut is used, and it is even less likely to decay if it is used for underground work. Box is used for some purposes; however that which grows on Mount Olympus⁷ is useless, because only short pieces can be obtained and the wood⁸ is full of knots. Terebinth is not used,⁹ except the fruit and the resin.

carts with solid wheels.¹ ταῖς conj. Sch.; τε καὶ UMV; τε καὶ μονοστρόφους ἀμάξας Ald.

² πηδος (with varying accent) MSS.: probably = πάδος, 4. 1. 3; πύξος Ald., but see § 7.

³ τεκτονίας can hardly be right. ⁷ cf. 3. 15. 5.

⁴ cf. 1. 8. 2, of box in general; Plin. 16. 71.

⁵ Inconsistent with 5. 3. 2.

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πλὴν τῷ καρπῷ καὶ τῇ ρητίνῃ. οὐδὲ φιλύκη πλὴν τοῖς προβάτοις ἀεὶ γάρ ἔστι δασεῖα. τῇ δὲ ἀφάρκῃ εἰς χάρακάς τε καὶ τὸ καίειν. κηλάστρῳ δὲ καὶ σημύδᾳ πρὸς βακτηρίας. ἔνιοι δὲ καὶ δάφνῃ τὰς γὰρ γεροντικὰς καὶ κούφας ταύτης ποιοῦσιν. ἵτεα δὲ πρὸς τε τὰς ἀσπίδας καὶ τὰς κίστας καὶ τὰ κανά καὶ τάλλα. προσαναλαβεῖν δέ ἔστι καὶ τῶν ἄλλων ἔκαστον ὄμοίως.

8 Διήρηται δὲ καὶ πρὸς τὰ τεκτονικὰ τῶν ὄργανων ἔκαστα κατὰ τὴν χρείαν· οἷον σφυρίον μὲν καὶ τερέτριον ἄριστα μὲν γίνεται κοτίνου· χρῶνται δὲ καὶ πυξίνοις καὶ πτελεῖνοις καὶ μελεῖνοις· τὰς δὲ μεγάλας σφύρας πιτυίνας ποιοῦσιν. ὄμοίως δὲ καὶ τῶν ἄλλων ἔκαστον ἔχει τινὰ τάξιν. καὶ ταῦτα μὲν αἱ χρεῖαι διαιροῦσιν.

VIII. Ἐκάστη δὲ τῆς ὕλης, ὥσπερ καὶ πρότερον ἐλέχθη, διαφέρει κατὰ τοὺς τόπους· ἔνθα μὲν γὰρ λωτὸς ἔνθα δὲ κέδρος γίνεται θαυμαστή, καθάπερ καὶ περὶ Συρίαν· ἐν Συρίᾳ γὰρ ἐν τε τοῖς ὅρεσι διαφέροντα γίνεται τὰ δένδρα τῆς κέδρου καὶ τῷ ὕψει καὶ τῷ πάχει· τηλικαῦτα γάρ ἔστιν ὥστ' ἔνια μὲν μὴ δύνασθαι τρεῖς ἄνδρας περιλαμβάνειν· ἐν τε τοῖς παραδείσοις ἔτι μείζω καὶ καλλίω. φαίνεται δὲ καὶ ἔάν τις ἐῷ καὶ μὴ τέμνῃ τόπον οἰκείον ἔκαστον ἔχον γίνεσθαι θαυμαστὸν τῷ μήκει καὶ πάχει. ἐν Κύπρῳ γοῦν οὐκ ἔτεμνον οἱ βασιλεῖς, ἅμα μὲν τηροῦντες καὶ ταμιευόμενοι, ἅμα

¹ Inconsistent with 5. 6. 2. φιλυρέα conj. Sch.

² καὶ σημύδᾳ conj. Sch.; καὶ μνίᾳ U; καὶ μύᾳ Ald. cf. 3. 14. 4.

ENQUIRY INTO PLANTS, V. VII. 7-VIII. 1

¹ *Alaternus* is only useful for feeding sheep; for it is always leafy. Hybrid *arbutus* is used for making stakes and for burning: *holly* and *Judas-tree*² for walking-sticks: some also use *bay* for these; for of this³ they make light sticks and sticks for old men. *Willow* is used for shields hampers baskets and the like. We might in like manner add the several uses of the other woods.

⁴ Distinction is also made between woods according as they are serviceable for one or other of the carpenter's tools: thus hammers and gimlets are best made of wild olive, but *box elm* and *manna-ash* are also used, while large mallets are made of *Aleppo pine*. In like manner there is a regular practice about each of the other tools. Such are the differences as to the uses of various woods.

Of the localities in which the best timber grows.

VIII. Each kind of timber, as was said before, differs according to the place⁵ where it grows; in one place *nettle-tree*, in another the *cedar* is remarkably fine, for instance in *Syria*; for in *Syria* and on its mountains the *cedars* grow to a surpassing height and thickness: they are sometimes so large that three men cannot embrace the tree. And in the parks they are even larger and finer. It appears that any tree, if it is left alone in its natural position and not cut down, grows to a remarkable height and thickness. For instance in *Cyprus* the kings used not to cut the trees, both because they took great care of them and hus-

³ *ταύτης* conj. H.; *ταύτας* UMVAld.

⁴ Plin. 16. 230.

⁵ *τόκους* conj. Scal. from G.; *πόδας* Ald.

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δὲ καὶ διὰ τὸ δυσκόμιστον εἶναι. μῆκος μὲν ἡνὶ τῶν εἰς τὴν ἐνδεκήρη τὴν Δημητρίου τμηθέντων τρισκαιδεκαόργυιον, αὐτὰ δὲ τὰ ξύλα τῷ μήκει θαυμαστὰ καὶ ἄοξα καὶ λεῖα. μέγιστα δὲ καὶ παρὰ πολὺ τὰ ἐν τῇ Κύρυφ φασὶν εἶναι· τῶν γὰρ ἐν τῇ Λατίνῃ καλῶν γινομένων ὑπερβολῆ καὶ τῶν ἐλατίνων καὶ τῶν πευκίνων—μείζω γὰρ ταῦτα καὶ καλλίω τῶν Ἰταλικῶν—οὐδὲν εἶναι

² πρὸς τὰ ἐν τῇ Κύρυφ. πλεῦσαι γάρ ποτε τοὺς Ῥωμαίους βουλομένους κατασκευάσασθαι πόλιν ἐν τῇ νῆσῳ πέντε καὶ εἴκοσι ναυσί, καὶ τηλικοῦτον εἶναι τὸ μέγεθος τῶν δένδρων ὥστε εἰσπλέοντας εἰς κόλπους τινὰς καὶ λιμένας διασχισθεῖσι τοῖς ἴστοῖς ἐπικινδυνεῦσαι. καὶ ὅλως δὲ πᾶσαν τὴν νῆσον δασεῖαν καὶ ὥσπερ ἡγριωμένην τῇ ὅλῃ δι’ ὃ καὶ ἀποστήναι τὴν πόλιν οἰκίζειν· διαβάντας δέ τινας ἀποτεμέσθαι πάμπολυ πλῆθος ἐκ τόπου βραχέος, ὥστε τηλικαύτην ποιῆσαι σχεδίαν ἡ ἔχρηστο πεντήκοντα ἴστοις· οὐ μην ἀλλὰ διαπεσεῖν αὐτὴν ἐν τῷ πελάγει. Κύρνος μὲν οὖν εἴτε διὰ τὴν ἄνεσιν εἴτε καὶ τὸ ἔδαφος καὶ τὸν ἀέρα πολὺ διαφέρει τῶν ἄλλων.

³ Ἡ δὲ τῶν Λατίνων ἔφυδρος πᾶσα· καὶ ἡ μὲν πεδεινὴ δάφνην ἔχει καὶ μυρρίνους καὶ ὁξύην θαυμαστήν· τηλικαῦτα γὰρ τὰ μήκη τέμνουσι ὥστ’ εἶναι διανεκῶς τῶν Τυρρηνίδων ὑπὸ τὴν τρόπιν· ἡ δὲ ὄρεινὴ πεύκην καὶ ἐλάτην. τὸ δὲ

¹ Demetrius Poliorcetes. cf. Plut. *Demetr.* 43; Plin. 16. 203.

² ἐπικινδυνεῦσαι conj. W.; ἐπὶ τὸν πύκνον Ald.; so U, but πυκνον.

³ i.e. against the overhanging trees. ? ἴστοις, to which διασχ. is more appropriate.

handed them, and also because the transport of the timber was difficult. The timbers cut for Demetrius' ¹ ship of eleven banks of oars were thirteen fathoms long, and the timbers themselves were without knots and smooth, as well as of marvellous length. But largest of all, they say, are the trees of Corsica; for whereas silver-fir and fir grow in Latium to a very great size, and are taller and finer than the silver-firs and firs of South Italy, these are said to be nothing to the trees of Corsica. For it is told how the Romans once made an expedition to that island with twenty-five ships, wishing to found a city there; and so great was the size of the trees that, as they sailed into certain bays and creeks, they got into difficulties ² through breaking their masts.³ And in general it is said that the whole island is thickly wooded and, as it were, one wild forest; wherefore the Romans gave up the idea of founding their city: however some of them made an excursion ⁴ into the island and cleared away a large quantity of trees from a small area, enough to make a raft with fifty sails; ⁵ but this broke up in the open sea. Corsica then, whether because of its uncultivated condition or because of its soil and climate, is very superior in trees to other countries.

The country of the Latins is all well watered; the lowland part contains bay, myrtle, and wonderful beech: they cut timbers of it of such a size that they will run the whole length ⁶ of the keel of a Tyrrhenian vessel. The hill country produces fir and silver-fir. The district called by Circe's name is, it

⁴ διαβάντας δέ τινας conj. St. from G; διαβάντα δέ τινα Ald. H.

⁵ ή ἐχρήσατο πεντ. ιστ. conj. Sch.; ή ἐχρήσαντο οἱ Ald. H.

⁶ διανεκῶς conj. Sch.; διὰ νεῶς Ald.

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Κιρκαῖον καλούμενον εἶναι μὲν ἄκραν ὑψηλήν, δασεῖαν δὲ σφόδρα καὶ ἔχειν δρῦν καὶ δάφνην πολλὴν καὶ μυρρίνους. λέγειν δὲ τοὺς ἐγχωρίους ὡς ἐνταῦθα ἡ Κίρκη κατώκει καὶ δεικνύναι τὸν τοῦ Ἐλπήνορος τάφον, ἐξ οὐ φύονται μυρρίναι καθάπερ αἱ στεφανώτιδες τῶν ἄλλων δυτῶν μεγάλων μυρρίνων. τὸν δὲ τόπον εἶναι καὶ τοῦτον νέαν πρόσθεσιν, καὶ πρότερον μὲν οὖν νῆσον εἶναι τὸ Κιρκαῖον, νῦν δὲ ὑπὸ ποταμῶν τινων προσκεχώσθαι καὶ εἶναι ἡιόνα. τῆς δὲ νῆσου τὸ μέγεθος περὶ ὄγδοήκοντα σταδίους. καὶ τὰ μὲν τῶν τόπων ἴδια πολλὴν ἔχει διαφοράν, ὥσπερ εἴρηται πολλάκις.

IX. Τὸ δὲ καὶ πρὸς τὴν πύρωσιν πῶς ἐκάστη τῆς ὕλης ἔχει λεκτέον ὁμοίως καὶ πειρατέον λαβεῖν. ἄνθρακες μὲν οὖν ἄριστοι γίνονται τῶν πυκνοτάτων, οἷον ἀρίας δρυὸς κομάρου· στερεώτατοι γάρ, ὥστε πλεῖστον χρόνον ἀντέχουσι καὶ μάλιστα ἴσχύουσι· δι' ὃ καὶ ἐν τοῖς ἀργυρείοις τούτοις χρῶνται πρὸς τὴν πρώτην τούτων ἔψησιν. χείριστοι δὲ τούτων οἱ δρῦνοι· γεωδέστατοι γάρ· χείρους δὲ καὶ οἱ τῶν πρεσβυτέρων τῶν νέων, καὶ μάλιστα οἱ τῶν γερανδρύών διὰ ταῦτό· ξηρότατοι γάρ, δι' ὃ καὶ πηδῶσι καιόμενοι· δεῖ δὲ ἔνικμον εἶναι.

2 Βέλτιστοι δὲ οἱ τῶν ἐν ἀκμῇ καὶ μάλιστα οἱ

¹ cf. Hom. *Od.* 10. 552 foll., 11. 51-80, 12. 8-15; Plin. 15. 119.

² νέαν πρόσθεσιν conj. Sch.; εἰς ἀνδρὸς θέσιν Ald.

is said, a lofty promontory, but very thickly wooded, producing oak, bay in abundance, and myrtle. There, according to the natives, dwelt Circe, and they shew Elpenor's tomb,¹ on which grow myrtles like those used for garlands, though other kinds of myrtle are large trees. Further it is said that the district is a recent addition² to the land, and that once this piece of land was an island, but now the sea has been silted up by certain streams and it has become united to the coast, and the size of the 'island'³ is about eighty furlongs in circumference. There is⁴ then much difference in trees, as has been said repeatedly, which is due to the individual character of particular districts.

Of the uses of various woods in making fire: charcoal, fuel, fire-sticks.

IX. Next we must state in like manner and endeavour to determine the properties of each kind of timber in relation to making fire. The best charcoal is made from the closest wood, such as *aria* (holm-oak) oak *arbutus*; for these are the most solid, so that they last longest and are the strongest; wherefore these are used in silver-mines for the first smelting of the ore. Worst of the woods mentioned is oak, since it contains most mineral matter,⁵ and the wood of older trees is inferior to that of the younger, and for the same reason that of really old trees⁶ is specially bad. For it is very dry, wherefore it sputters as it burns; whereas wood for charcoal should contain sap.

The best charcoal comes from trees in their prime,

³ cf. Plin. 3. 57. ⁴ έχει conj. Sch.; είναι Ald.

⁵ i.e. and so makes much ash. ⁶ cf. 2. 7. 2.

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τῶν κολοβῶν· συμμέτρως γάρ ἔχουσι τῷ πυκνῷ
καὶ γεώδει καὶ τῷ ὑγρῷ· βελτίους δὲ καὶ ἐκ τῶν
εὐείλων καὶ ξηρῶν καὶ προσβόρρων ἡ ἐκ τῶν
παλισκίων καὶ ὑγρῶν καὶ πρὸς νότον καὶ εἰ
ἐνικμοτέρας ὑλης, πυκνῆς· ὑγροτέρα γάρ ἡ πυκνή.
καὶ ὅλως, ὅσα ἡ φύσει ἡ διὰ [τὸν] τόπον ξηρότερον
πυκνότερα, ἐξ ἀπάντων βελτίω διὰ τὴν αὐτὴν
αἰτίαν. χρεία δὲ ἄλλων ἄλλη· πρὸς ἐνια γάρ
ζητοῦσι τοὺς μαλακούς, οἷον ἐν τοῖς σιδηρείοις
τοὺς τῆς καρύας τῆς Εὐβοϊκῆς, ὅταν ἥδη κεκαυ-
μένος ἡ, καὶ ἐν τοῖς ἀργυρείοις τοὺς πιτυῖνους.

³ χρῶνται δὲ καὶ αἱ τέχναι τούτοις. ζητοῦσι δὲ
καὶ οἱ χαλκεῖς τοὺς πευκίνους μᾶλλον ἡ δρυῖνους·
καίτοι ἀσθενέστεροι ἀλλ' εἰς τὴν φύσησιν ἀμεί-
νους ὡς ἡσσον καταμαραινόμενοι· ἔστι δὲ ἡ φλὸξ
δέξιτέρα τούτων. τὸ δὲ ὅλον δέξιτέρα φλὸξ καὶ
ἡ τούτων καὶ ἡ τῶν ξύλων τῶν μανῶν καὶ κούφων
καὶ ἡ τῶν αὔων· ἡ δ' ἐκ τῶν πυκνῶν καὶ χλωρῶν
νωθεστέρα καὶ παχυτέρα· πασῶν δὲ δέξιτάτη ἡ
ἐκ τῶν ὑλημάτων· ἄνθρακες δὲ ὅλως οὐ γίνονται
διὰ τὸ μὴ ἔχειν τὸ σωματῶδες.

⁴ Τέμνουσι δὲ καὶ ζητοῦσι εἰς τὰς ἀνθρακιὰς τὰ

¹ κολοβῶν conj. Palm.; κολλάβων U; κολάβων Ald.

² δὲ καὶ ἐκ τῶν conj. W.; δὲ καὶ οἱ τῶν UΜVP; δὲ οἱ τῶν Ald.H.

³ καὶ εἰ ἐνικμοτέρας conj. W.; καὶ οἱ ἐνακμοτέρας U; καὶ ἡ ἐν
ἀκμητέρας MV; καὶ οἱ ἐν ἀκμητέρας Ald.Bas.Cam. The sense
seems to require ὑγροτέρας for ἐνικμοτέρας and ἐνικμοτέρα for
ὑγροτέρα. G seems to have had a fuller text.

⁴ i.e. from growing in a damper place. cf. 5. 9. 4.

and especially from trees which have been topped¹ : for these contain in the right proportion the qualities of closeness admixture of mineral matter and moisture. Again better charcoal comes from trees² in a sunny dry position with a north aspect than from those grown in a shady damp position facing south. Or, if the wood³ used contains a good deal of moisture,⁴ it should be of close texture ; for such wood contains more sap.⁵ And, for the same reason, that which is of closer texture either from its own natural character or because it was grown in a drier spot,⁶ is, whatever the kind of tree, better.⁷ But different kinds of charcoal are used for different purposes : for some uses men require it to be soft ; thus in iron-mines they use that which is made of sweet chestnut when the iron has been already smelted, and in silver-mines they use charcoal of pine-wood : and these kinds are also used by the crafts. Smiths⁸ require charcoal of fir rather than of oak : it is indeed not so strong, but it blows up better into a flame, as it is less apt to smoulder : and the flame from these woods is fiercer. In general the flame is fiercer not only from these but from any wood which is of open texture and light, or which is dry : while that from wood which is of close texture or green is more sluggish and dull. The fiercest flame of all is given by brushwood ; but charcoal cannot be made from it at all, since it has not the necessary substance.

They cut and require for the charcoal-heap straight

⁵ cf. § 1 *ad fin.*

⁶ ξηρότερον conj. W.; ξηρότερα UMV; πυκνότερα ξηρότερα Ald. I have bracketed *τὸν*.

⁷ βελτίω conj. Sch.; βελτίων UM; βέλτιον Ald. H.

⁸ cf. Plin. 16. 23.

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εὐθέα καὶ τὰ λεῖα· δεῖ γὰρ ὡς πυκνότατα συνθεῖναι πρὸς τὴν κατάπνιξιν. ὅταν δὲ περιαλείψωσι τὴν κάμινον, ἔξαπτουσι παρὰ μέρος παρακεντοῦντες ὄθελίσκοις. εἰς μὲν τὴν ἀνθρακιὰν τὰ τοιαῦτα ξητοῦσι.

Δύσκαπνα δὲ τῷ γένει μὲν ὅλως τὰ ὑγρά· καὶ τὰ χλωρὰ διὰ τοῦτο δύσκαπνα. λέγω δὲ τὰ ὑγρὰ τὰ ἔλεια, οἷον πλάτανον ἵτεαν λεύκην αἴγειρον· ἐπεὶ καὶ ἡ ἄμπελος ὅτε ὑγρὰ δύσκαπνος. ἐκ δὲ τῆς ἴδιας φύσεως ὁ φοῖνιξ, δῆν δὴ καὶ μάλιστά τινες. ὑπειλήφασι δύσκαπνον· ὅθεν καὶ Χαιρήμων ἐποίησε “τοῦ τε δυσκαπνοτάτου φοίνικος ἐκ γῆς 5 ῥιζοφοιτήτους φλέβας.” δριμύτατος δὲ ὁ καπνὸς συκῆς καὶ ἐρινεοῦ καὶ εἴ τι ἄλλο ὀπῶδες· αἰτία δὲ ἡ ὑγρότης· φλοϊσθέντα δὲ καὶ ἀποβρεχθέντα ἐν ὕδατι ἐπιρρύτῳ καὶ μετὰ ταῦτα ξηρανθέντα πάντων ἀκαπνότατα καὶ φλόγα μαλακωτάτην ἀνίησιν, ἄτε καὶ τῆς οἰκείας ὑγρότητος ἔξηρημένης. δριμεῖα δὲ καὶ ἡ τέφρα καὶ ἡ κονία ἡ ἀπὸ αὐτῶν. μάλιστα δέ φασι τὴν ἀπὸ τῆς ἀμυγδαλῆς.

6 Πρὸς δὴ τὰς καμινίας καὶ τὰς ἄλλας τέχνας ἄλλη ἄλλοις χρησίμη. ἐμπυρεύεσθαι δὲ ἄριστα συκῆ καὶ ἐλάα· συκῆ μέν, ὅτι γλίσχρον τε καὶ μανόν, ὥστε ἔλκει τε καὶ οὐ δίεισιν· ἐλάα δέ, ὅτι πυκνὸν καὶ λιπαρόν.

¹ λεῖα conj. Scal. from G; νέα Ald.

² With sods. cf. Plin., l.c., who seems to have had a fuller text.

³ An Athenian tragic poet. Scal. restores the quotation
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smooth¹ billets: for they must be laid as close as possible for the smouldering process. When they have covered² the kiln, they kindle the heap by degrees, stirring it with poles. Such is the wood required for the charcoal-heap.

In general damp wood makes an evil smoke, and for this reason green wood does so: I mean the damp woods which grow in marshy ground, such as plane willow abele black poplar: for even vine-wood, when it is damp, gives an evil smoke. So does palm-wood of its own nature, and some have supposed it to give the most evil smoke of all: whence Chaeremon³ speaks of "Veins issuing underground from roots of palm with its malodorous smoke." Most pungent is the smoke of fig-wood, whether wild or cultivated, and of any tree which has a curdling juice; the reason lies in the sap; when such wood has been barked and soaked in running water and then dried, it gives as little smoke as any other, and sends up a very soft⁴ flame, since its natural moisture also has been removed. The cinders and ashes of such wood are also pungent, and especially, they say, those of almond-wood.

For the crafts requiring a furnace and for other crafts various woods are serviceable according to circumstances.⁵ For kindling fig and olive are best: fig, because it is tough and of open texture, so that it easily catches fire and does not let it through,⁶ olive, because it is of close texture and oily.

thus: τοῦ τε δυσκαπνωτάτου | φοίνικος ἐκ γῆς βιζοφοιτήτους φλέβας (βιζοφιτύτους conj. Schneidewin).

⁴ i.e. not sputtering.

⁵ καὶ . . . χρησίμη conj. W.; τέχναις ἀλλήλοις χρησίμη U; τ. ἀλλήλας χρ. MV; τέχνη ἀλλη ἔστι χρ. P; τ. ἀλλήλοις ἔστι χρησίμη Ald. ⁶ i.e. burn out quickly.

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Πυρεῖα δὲ γίνεται μὲν ἐκ πολλῶν, ἄριστα δέ, ὡς φησι Μενέστωρ, ἐκ κιττοῦ· τάχιστα γὰρ καὶ πλεῖστον ἀναπνεῖ. πυρεῖον δέ φασιν ἄριστον μὲν ἐκ τῆς ἀθραγένης καλουμένης ὑπό τινων· τοῦτο δ' ἐστὶ δένδρον ὅμοιον τῇ ἀμπέλῳ καὶ τῇ οἰνάνθῃ τῇ ἀγρίᾳ· ὥσπερ ἐκεῖνα καὶ τοῦτο ἀναβαίνει πρὸς τὰ δένδρα. δεῖ δὲ τὴν ἐσχάραν ἐκ τούτων ποιεῖν τὸ δὲ τρύπανον ἐκ δάφνης· οὐ γὰρ ἐκ ταύτου τὸ ποιοῦν καὶ πάσχον, ἀλλ' ἔτερον εὐθὺν δεῖ κατὰ φύσιν, καὶ τὸ μὲν δεῖ παθητικὸν εἶναι τὸ δὲ ποιητικόν. οὐ μὴν ἀλλὰ καὶ ἐκ τοῦ αὐτοῦ γίνεται καί, ὡς γέ τινες ὑπολαμβάνουσιν, οὐδὲν διαφέρει. γίνεται γὰρ ἐκ ράμνου καὶ πρίνου καὶ φιλύρας καὶ σχεδὸν ἐκ τῶν πλείστων πλὴν ἐλάσ· ὃ καὶ δοκεῖ ἄτοπον εἶναι· καὶ γὰρ σκληρότερον καὶ λιπαρὸν ἡ ἐλά· τοῦτο μὲν οὖν ἀσύμμετρον ἔχει δῆλον ὅτι τὴν ὑγρότητα πρὸς τὴν πύρωσιν. ἀγαθὰ δὲ τὰ ἐκ ράμνου· ποιεῖ δὲ τοῦτο καὶ τὴν ἐσχάραν χρηστήν· πρὸς γὰρ τῷ ξηρὰν καὶ ἄχυμον εἶναι δεῖ καὶ μανοτέραν, ἵν' ἡ τρίψις ἴσχύῃ, τὸ δὲ τρύπανον ἀπαθέστερον· δι' ὃ το τῆς δάφνης ἄριστον· ἀπαθὲς γὰρ ὃν ἐργάζεται τῇ δριμύτητι. πάντα δὲ τὰ πυρεῖα βορείοις μὲν θάττον καὶ μᾶλλον ἔξαπτεται, νοτίοις δὲ ἡττον· καὶ ἐν μὲν τοῖς μετεώροις μᾶλλον, ἐν δὲ τοῖς κοίλοις ἡττον.

8 ¹ Ανίει δὲ τῶν ξύλων τὰ κέδρινα καὶ ἀπλῶς ὡν

¹ π. δὲ γίνεται μὲν conj. Sch.; π. μὲν γίνεται δὲ UΜV Ald.

² cf. 1. 2. 3 n.

³ κιττοῦ conj. Bod. from *de igne* 64, Plin. 16. 208; καρύου Ald.

⁴ πυρεῖον conj. Salm.; πυροῦ UΜV Ald.

ENQUIRY INTO PLANTS, V. ix. 6-8

Fire-sticks are made¹ from many kinds of wood, but best, according to Menestor,² from ivy³: for that flares up most quickly and freely. They say also that a very good fire-stick⁴ is made of the wood which some call traveller's joy; this is a tree like the vine or the 'wild vine,' which, like these, climbs up trees. The stationary piece⁵ should be made of one of these, the drill of bay; for the active and passive parts of the apparatus should not be of the same wood, but different in their natural properties to start with, one being of active, the other of passive character. Nevertheless they are sometimes made of the same wood, and some suppose that it makes no difference. They are made in fact of buckthorn kermes-oak lime and almost any wood except olive; which seems surprising, as olive-wood is rather hard and oily; however it is plainly its moisture which makes it less suitable for kindling. The wood of the buckthorn is also good, and it makes a satisfactory stationary piece; for, besides being dry and free from sap it is necessary that this should also be of rather open texture, that the friction may be effectual; while the drill should be one which gets little worn by use. And that is why one made of bay is best; for, as it is not worn by use, it is effective through its biting quality. All fire-sticks take fire quicker and better in a north than in a south wind, and better in an exposed spot than in one which is shut in.

Some woods, such as prickly cedar, exude⁶ moisture, and, generally speaking, so do those

¹ i.e. the piece of wood to be bored. *cf. de igne, l.c.*

² Ἀνέστωρ. ³ ἄνηδει.

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έλαιωδης ἡ ὑγρότης· δι' ὃ καὶ τὰ ἀγάλματά φασιν ἴδειν ἐνίστε· ποιοῦσι γὰρ ἐκ τούτων. ὃ δὲ καλοῦσιν οἱ μάντεις Εἰλειθυίας ἄφεδρον, ὑπὲρ οὐ καὶ ἐκθύονται, πρὸς τοὺς ἐλατίνοις γίνεται συνισταμένης τινὸς ὑγρότητος, τῷ σχήματι μὲν στρογγύλον μέγεθος δὲ ἡλίκον ἄπιον ἡ καὶ μικρῷ μείζον ἡ ἐλαττον. ἐκβλαστάνει δὲ μάλιστα τὰ ἐλιένα καὶ ἀργὰ κείμενα καὶ εἰργασμένα πολλάκις, ἐὰν ἴκμάδα λαμβάνῃ καὶ ἔχῃ τόπον νοτερόν. ὕσπερ ἥδη τις στροφεὺς τῆς θύρας ἐβλάστησε, καὶ εἰς κυλίκιον πλίνθινον τεθεῖσα κώπη ἐν πήλῳ.

¹ cf. C.P. 5. 4. 4. οἱ μάντεις . . . ἐλατίνοις conj. Lobeck.; οἱ λεῖαν . . . τοῖς ἐκατίνοις U; οἰλεῖαν . . . τοὺς ἐκματίνοις V; οἱ λεῖαν τῆς εἰληθῆας . . . τοῖς ἐκματίνοις M; οἱ λεῖαν τῆς ἀληθύλας ἔφαίδρον . . . τοὺς ἐκατίνοις P₂; ίλεῖαν τῆς εἰληθυίας ἔφυδρον . . . τοὺς ἐκατίνοις Ald.

whose sap is of an oily character; and this is why statues are sometimes said to 'sweat'; for they are made of such woods. That which seers call the *menses* of Eileithuia,¹ and for the appearance of which they make atonement,² forms on the wood of the silver-fir when some moisture gathers on it: the formation is round³ in shape, and in size about as large as a pear, or a little larger or smaller. Olive-wood is more apt than other woods to produce shoots even when lying idle or made into manufactured articles; this it often does, if it obtains moisture and lies in a damp place; thus the socket of a door-'hinge'⁴ has been known to shoot, and also an oar which was standing in damp earth in an earthenware vessel.⁵

² i.e. as a portent. cf. *Char.* 16. 2.

³ στρόγγυλον conj. Sch.; στρογγύλης UMVP₂Ald.

⁴ cf. 5. 6. 4; Plin. 16. 230.

⁵ πλινθ. τεθ. κώπη ἐν πήλῳ conj. Spr.; πλίνθινον τεθεὶς τῇ κώπῃ πηλός P₂Ald.H.

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